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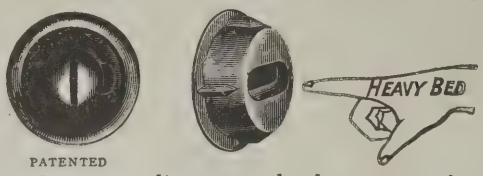
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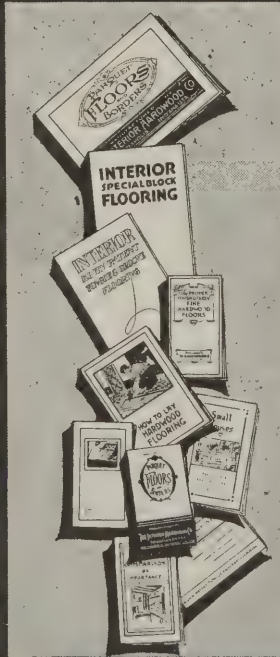
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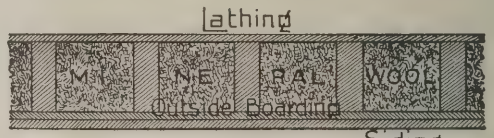
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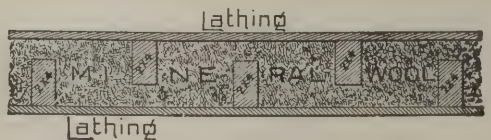
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BUILDING AGE

NEW YORK, JANUARY, 1917



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INTERIOR FINISHED IN WHITE—SPACIOUS MASTER'S BEDROOM WITH PRIVATE BATH

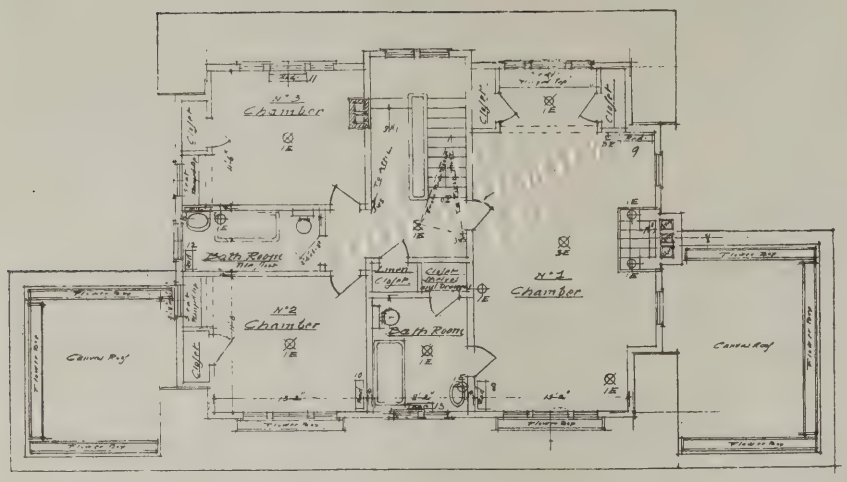
THE Dutch Colonial house is peculiarly indigenous to the United States. Its characteristic gambrel roof, architecturally difficult to handle though it is, obtains a rare charm in skilful hands. The many attractive possibilities, together with the economy of space afforded by the roof lines, render the Dutch Colonial house always of interest to the builder, for it is a type whose design never seems to grow old.

The house here described is of this popular type and contains features of undoubted interest. The characteristic gambrel is broken higher up than usual, but is saved from any appearance of slimness by the continuation of the upper slope out in front, making the second story light and roomy. A slight curve breaks the lower roof, so that it extends gracefully to cover the porch. The grouping of the second-story windows is worthy of notice, for they form one of the attractive features of the design. Two small center windows, locating the master's bathroom, are flanked on either side by a triple window, which consists of a center window between two of lesser width.

The porch roof extends out on one side so as to form a small porch open on three sides. The roof of this extension porch is covered with canvas and forms a pleasant summer addition to the master's bedroom. French windows admit plenty of light to the rooms under the overhang.

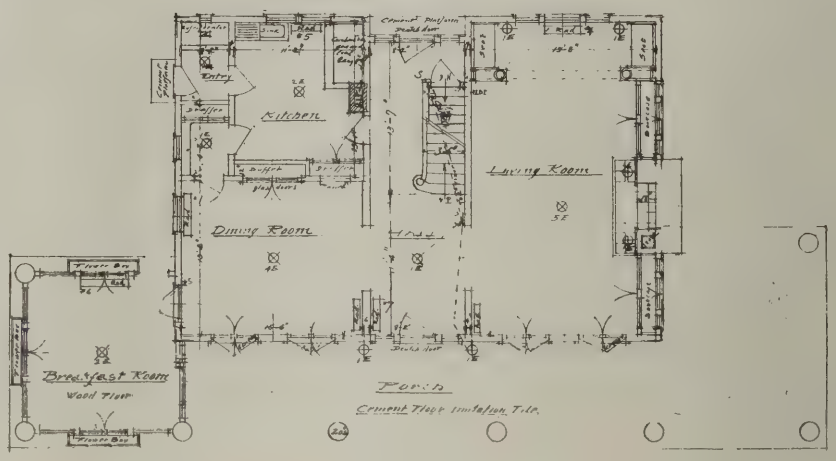
The front door is of the Dutch type and contains four lights, being flanked on either side by a narrow ten-light window.

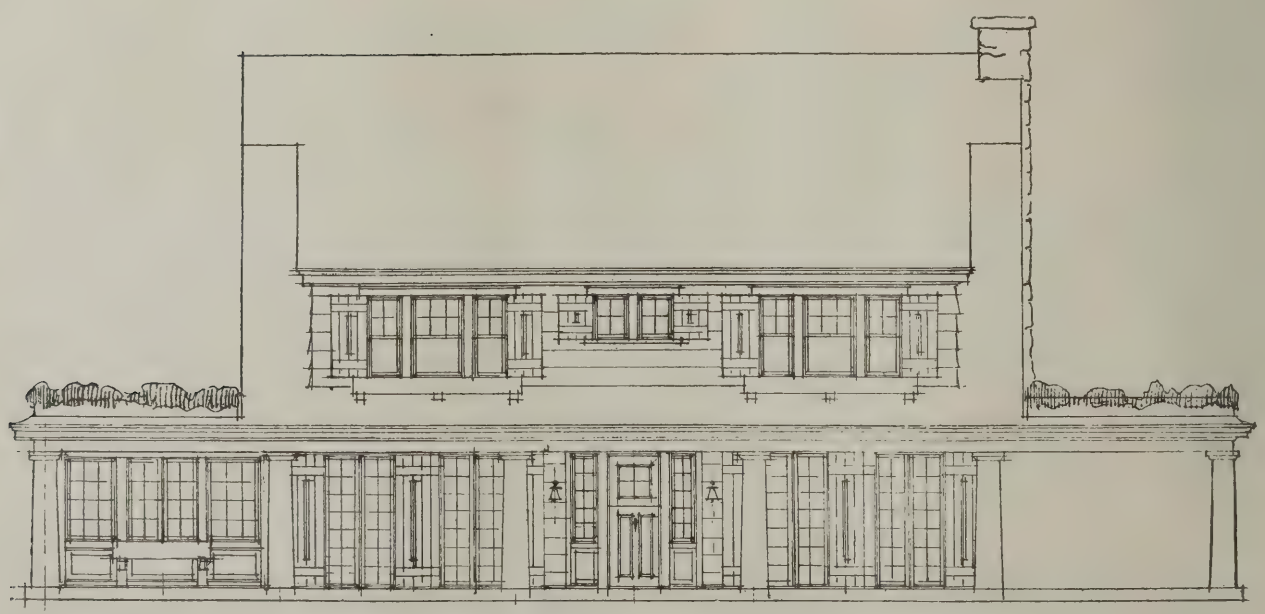
Upon entering the house an attractive vista is presented. To the right is the living room, extending the full depth of the house and containing a fireplace flanked by bookcases over which windows are placed. A plaster arch partially separates a nook at the far end. To the left is the dining



At the Left is the Second Story Plan —Scale 1/16 In. to the Foot

At the Right is the Main Floor Plan Showing the General Layout of the Rooms. Scale 1/16 In. to the Foot





Front Elevation—Scale 3/32 In. to the Foot

FRONT ELEVATION AND FLOOR PLANS OF THE RESIDENCE OF W. C. REED

room, and one can glimpse the breakfast room adjoining it. The dining room contains a recess for a buffet built into the kitchen partition and adjoining a dresser which opens on the kitchen side.

Communication between dining room and kitchen is established through a well-equipped pantry, and the front door may be reached directly from the kitchen by means of the main hall, which extends through the house and opens through a Dutch door into the rear garden. This planning enables the domestic to pass from the kitchen to the front door without going through any other room.

The second floor contains three bedrooms and two baths. The master's bedroom connects with a private bath, and contains a fireplace. A nook is formed at one end by a plaster arch, on each side



VIEW IN THE LIVING ROOM, LOOKING TOWARD THE REAR OF THE HOUSE

of which is a closet with a mirror. Windows throughout the second story are of the double-hung type, located as shown on the elevations.

In the attic is a bedroom, a bathroom, two storage rooms and a linen closet.

The footings are of a 1:3:5 concrete mixture and are 12 inches wider than the foundation wall. The latter is of brick laid in Portland cement mortar and was waterproofed with a heavy coat of tar. The veranda foundation walls are also of brick and were cleaned at completion with diluted muriatic acid. The piers are of brick, with cement caps.

The cellar floor consists of 6 in. of broken stone covered with cinder concrete to which was added a one-inch top dressing of Portland cement.

The chimney is of split granite, and was pointed with white mortar. The flues are lined with terra cotta.

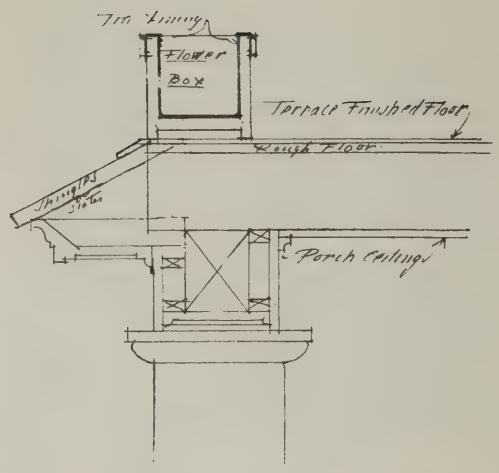
The framing timber is of spruce, the sills, girders, posts and wall plates being 4 x 6 in. The first and second floor joists are 2 x 10 in. placed 12 and 16 in. on centers, and the third floor joists are 2 x 8 in., also placed 16 in. on centers, all bridged with 2 x 4-in. stuff. The studs are 2 x 4 in., the braces 4 x 4 in. and the rafters 2 x 6 in. The girders in the cellar are of yellow pine and are 8 x 10 in. Headers and trimmers are doubled, all openings over 36 in. wide being trussed.

The wall sheathing is of $\frac{7}{8}$-in. spruce laid diagonally. Over this was placed black Neponset building paper which received the exterior covering of cypress siding exposed 10 in. to the weather and was given three coats of white lead and linseed oil

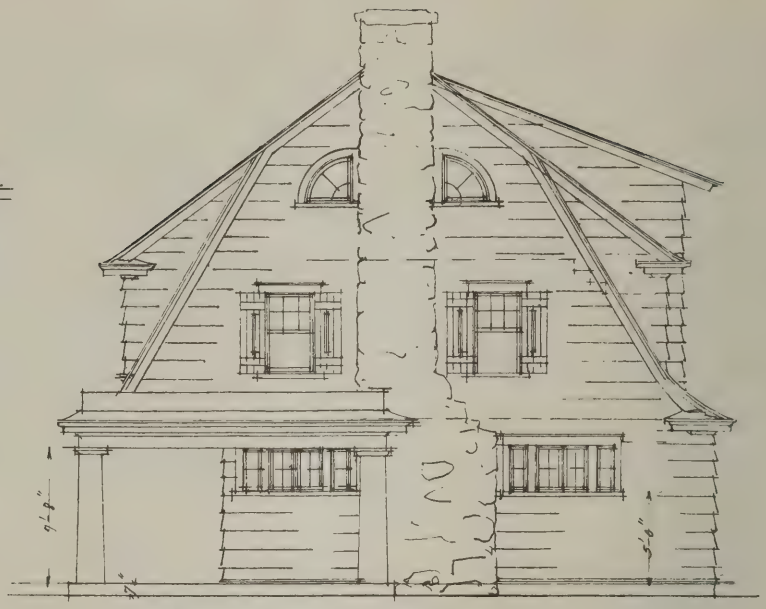
The roof is covered with "J. M. Transite" Asbestos shingles made by the H. W. Johns-Manville Company, 296 Madison Avenue, New York City. The shingles were dipped 10 in. with Samuel Cabot's green shingle stain and at completion were given one brush coat to bring out a uniform color. The flashing was given two coats of Princess Metallic roof paint. The gutters and leaders are of copper.

The exterior trim is of white pine. The porch is ceiled with $\frac{7}{8}$ x $2\frac{1}{2}$-in. tongued and grooved North Carolina pine and the floor is of 6 x 6-in. red tile. The porch columns are of white pine.

All doors are of white pine with oak saddles and sills. The interior doors are of a two-panel type and are $1\frac{3}{8}$ in. thick.



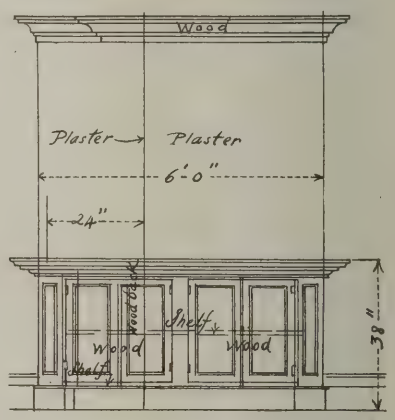
Details of Porch Roof—Scale ½ In. to the Foot



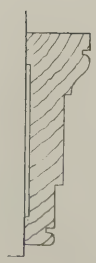
Side (Right) Elevation—Scale 3/32 In. to the Foot



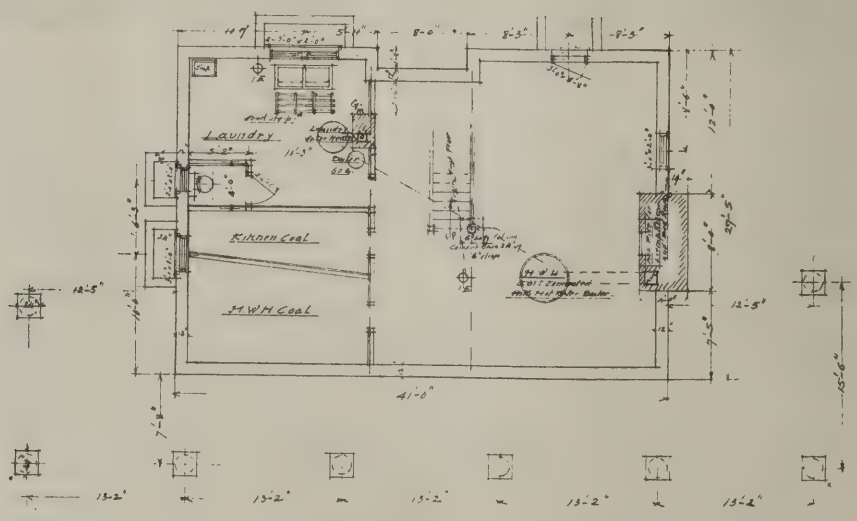
Side (Left) Elevation—Scale 3/32 In. to the Foot



Elevation of Proposed Dining Room Buffet—Scale ¼ In. to the Foot



Inside Trim on First Floor — Scale 3 In. to the Foot



Basement Plan—Scale 1/16 In. to the Foot

PLAN, ELEVATIONS AND MISCELLANEOUS CONSTRUCTIVE DETAILS

French and double-hung windows are of white pine, the latter being hung with Silver Lake sash cord.

The walls of the rooms throughout are plastered to a hard finish, the work being three coat. The lath is spruce, breaking joints every tenth lath.

The main stairs have ⅞-in. risers of whitewood, 1⅛-in. treads of birch and the handrail is also of birch.

The floors throughout are double, the sub-flooring being ⅞-in. tongued and grooved North Carolina pine laid diagonally. Over this was placed flooring felt which in turn received the finish floor of ⅞ x 2½-in. tongued and grooved comb-grained North Carolina pine, blind nailed. The completed floors were given one coat of Murphy paste wood filler, one coat of transparent shellac and finished with one coat of English floor wax.

Interior trim is of whitewood painted white throughout, the work consisting of four coats of white lead, the last coat being applied enamel. The fresh, clean effect is certainly beautiful.

The bathrooms are alike in finish. The floors are of white unglazed square tile with sanitary cove to meet the plinth course. A tile wainscot 4 ft. 6 in. high is capped by a tile molding. Above this was applied Kings Windsor cement, which was given an enamel finish. Each bathroom contains a recessed medicine cabinet 24 x 27 in., provided with a door containing a beveled plate-glass mirror. The master's bathroom contains a shower, fittings being concealed. The fixtures are of vitreous china manufactured by Thomas Maddock, Trenton, N. J. The shower is provided with a Speakman Shower Mixometer.

Electricity is used for lighting purposes. Heating is by means of steam, the equipment being made by the United States Radiator Corporation. There is a water heater made by the same company. The pipe covering is made by the New York Asbestos Co. The radiators are provided with automatic syphon valves manufactured by W. A. Russell & Co., New York.

The house here illustrated and described is located at Harmon, New York, and was built for W. C. Reed in accordance with plans and specifications prepared by Architect Henri Vallet, 192 Main Street, New Rochelle, New York.

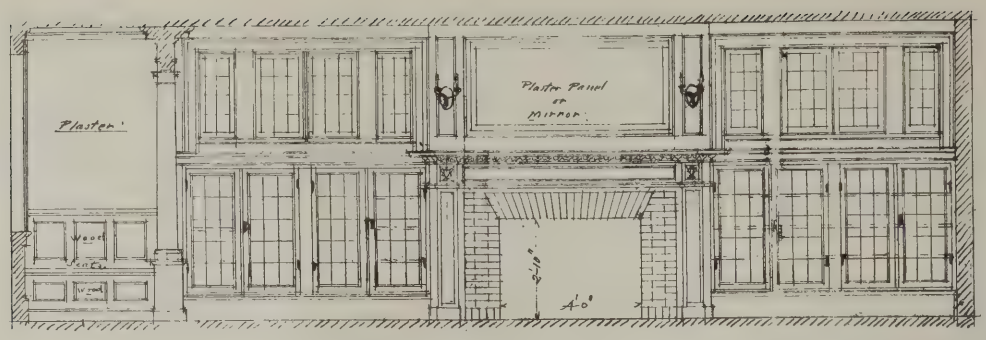


VIEW IN THE DINING ROOM, LOOKING INTO THE BREAKFAST ROOM

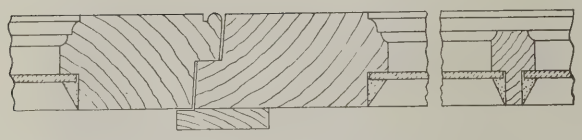
In this case the carpentry and the plumbing work were done by weekly payroll, and the materials were purchased by the owner of the house.

NEBUCHADNEZZAR AS A BUILDER

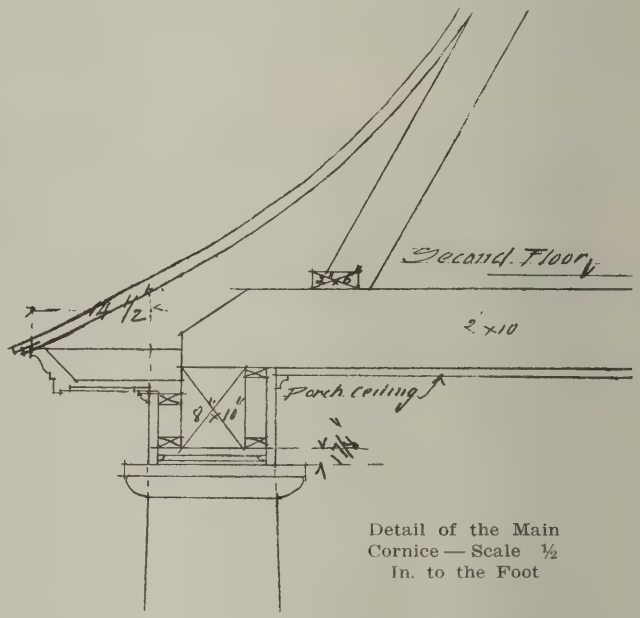
Probably the greatest builder the world ever had was Nebuchadnezzar, King of Babylon from 604 to 561 B. C. There is hardly a ruin in Babylonia which does not show traces of his work. Nearly everywhere in Mesopotamia, and even in Persia, are found bricks bearing his name. He delighted in restoring the old temples. He surrounded defenseless cities with walls and moats. He confined the rivers to their courses with huge brick



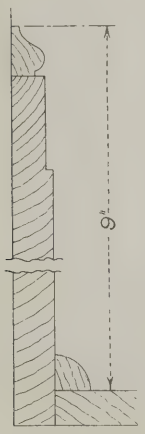
Southern Elevation in the Living Room as Originally Conceived by the Architect—Scale 3/16 In to the Foot



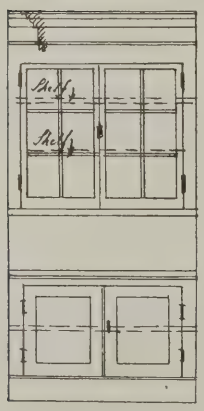
Section Through Meeting Rail and Muntin of French Doors—Scale 3 In. to the Foot



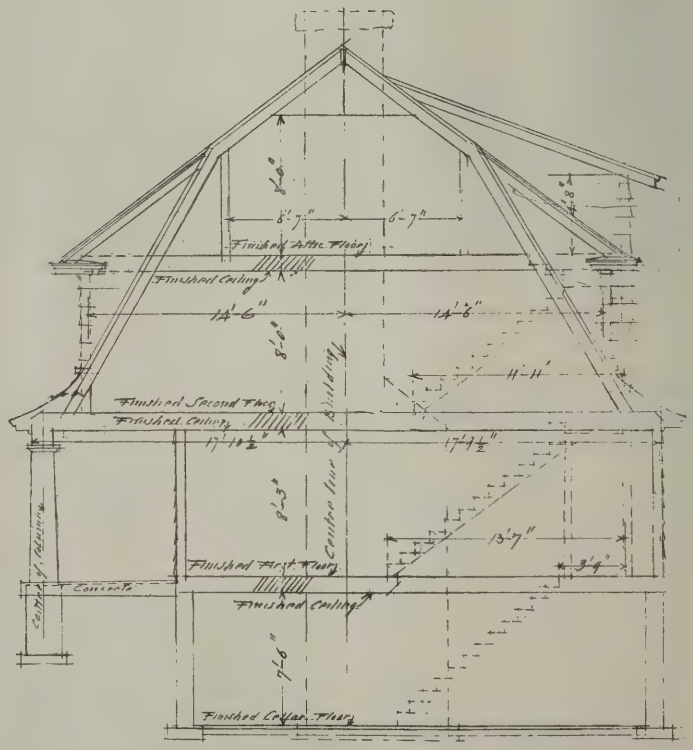
Detail of the Main Cornice — Scale ½ In. to the Foot



Detail of Base on First Floor — Scale 3 In. to the Foot



Pantry Dresser — Scale ¼ In. to the Foot



Vertical Cross Section—Scale 3/32 In. to the Foot

SECTIONAL VIEW AND CONSTRUCTIVE DETAILS OF RESIDENCE OF W. C. REED

embankments. Shortly before his time Babylon was completely destroyed, and its foundations were scraped into the river, but he rebuilt and enlarged the city. The temples with which he adorned it amazed even the travelers from distant Greece. The walls surrounding it were one of the seven wonders of the ancient world. Fortunately it was Nebuchadnezzar's custom, whenever he built or restored a temple, says Edgar J. Banks in the *Scientific American,* to write a long description of his building operations upon a cylinder of clay, and to bury the record in the walls that future generations might read of his work. His wish has been fulfilled, for during the past two years several of the cylinders have been discovered by Arabs, and have found their way to Europe and America.

One of the last of the cylinders to appear, and now in the possession of the author, was discovered by Arabs in a ruin called Wana-Sedoum, or more correctly Wannet es-Sa'dun, a day's journey to the south of Babylon on the Euphrates River. It mentions the ancient name of the place as Marad, and thus another city is added to the map of ancient Babylonia. The cylinder is really a truncated cone, 8½ inches high and 18 inches in its greatest circumference. It is of finely molded clay thrown upon a potter's wheel, and built up as if it were a vase without a bottom. The interior walls distinctly show the finger marks of the ancient potter. The walls are very thick. After the cylinder was inscribed, it was burned until the clay resembled a compact sand-colored stone. The inscription is in three columns, with 145 lines of cuneiform writing, and so well preserved that every one of the fifteen hundred or so of wedge groups is perfect.

The first part of the inscription is familiar because it is practically a duplicate of the records upon similar cylinders discovered elsewhere. Nebuchadnezzar begins in his boastful way by telling who and how great he is. Then follows an account of the building of the great walls of Babylon "mountain high," and of the restoration of several temples in Babylon and other Babylonian cities, including the Biblical cities of Ur, Larsa and Erech, and of the tower of Borsippa, which travelers have called the Tower of Babel. His account of how the gods instructed him to make a charm against disease, and to bury it in the foundation of the temple, hints at the superstition of his time. His prayer to the goddess Ninharrak shows his piety and command of beautiful language.



VIEW IN MASTER'S BEDROOM IN RESIDENCE OF W. C. REED AT HARMAN, N. Y.

The last part of the inscription is of historical importance, for it is new. In it he speaks of restoring the temple at Marad, and ends with a prayer to Lugal-Marad, the local deity of the place. A translation of the inscription is as follows:

I am Nebuchadnezzar, King of Babylon, the great, the mighty, the favorite of Marduk, the powerful prince, the beloved of Nabu, the ruler who knows not weariness, the protector of the temples Esagil and Ezida, who is obedient to Nabu and Marduk his lords, who does their bidding; the wise Lord, the darling and the joy of the heart of the great gods, the first-born son of Nabopolassar, King of Babylon.

When Marduk, the great lord, made me the rightful son, to rule the land, to be the shepherd of his people, to care for the city to rebuild the temples, he bestowed upon me his great power. Tremblingly I was obedient to Marduk, my lord. I completed Imgur-Bel and Nimitti-Bel, the great walls of Babylon, his mighty city, the city of his exalted power. At the entrance of the great gates I erected strong bulls of bronze and terrible serpents standing upright. My father did that which no previous king had done. With mortar and

bricks he built two moat walls about the city, and I with mortar and bricks built a third great moat wall, and joined it and united it closely with the moat walls of my father. I laid its foundations deep to the water level; I raised its top mountain high. I constructed a moat wall of burned brick about the west wall of Babylon. My father built the moat walls of the Arahtu canal securely with mortar and brick. He built well the quays along the opposite shore of the Euphrates, but he did not finish all his work. But I, his first born son, the beloved of his heart, built the moat walls of Arahtu with mortar and bricks, and joining them with the moat walls of my father, made them very solid.

Esagil, the wonderful temple, the palace of heaven and earth, Ekua, the temple of Marduk, the lord of the gods, Ka-hilisug, the dwelling place of Zarpanit, Ezida, the temple of the king of the gods of heaven and earth, I clothed with shining gold, and made bright like the day.

Ezida, the favorite temple, beloved of Nabu, I restored in Borsippa. With gold and jewels I made it beautiful like paradise. I overlaid with gold its great beams of cedar, and arranged them by three to cover Emahtila, the shrine of Nabu. I rebuilt and made lofty Emach the temple of Ninharsag, in the center of Babylon. . . .

I did a thing which no king before me had ever done. To the west of Babylon, at a great distance from the outer wall, I constructed an inclosing wall 4,000 cubits in length about the city. I dug its moat to the water level. I walled up its sides with mortar and burned bricks, and I united it securely with the moat wall of my father. Along its edge I built a great wall of mortar and burned bricks mountain high.

I rebuilt Tabisupurshu, the wall of Borsippa. To strengthen it, I built the wall of its moat about the city with mortar and burned bricks. In Borsippa I rebuilt the temple to Tur-lil-en, the god who breaks the weapons of my foes. Ebarra, temple of Shamash in Sippar, Eanna, temple of Ishtar in Erech, Ebarra, temple of Shamash in Larsa, Egishshirgal, temple of Sin in Ur, the sacred temples of the great gods, I restored and completed.

The support of Esagil and Ezida, the rebuilding of Babylon and Borsippa, which I caused to be more magnificent than before, I did as I was instructed. All my noble deeds for the maintenance of the sacred temples of the great gods, which I did better than the kings, my fathers, I wrote upon a tablet of stone, and fixed for distant days.

May the wise men after me read of all my works which I have written upon a tablet. May they comprehend the glory of the gods. I accomplished the building of the cities of the gods and goddesses, as Marduk the great lord bade me, and urged my heart to undertake.

In those days, for Ninharrak, my beloved mistress, who guards my life and gives me good dreams, I dug up and found the ancient foundation of Eharsagil, her temple in Babylon, which fell to ruins in ancient days, and no previous ruler had restored. . . . But the temple was not suitable for the abode of Ninharrak. To strengthen the walls of that temple, and of mortar and bricks to make a temple worthy of Ninharrak, I sought earnestly. Upon the day when I asked the gods to reveal to me the future, Ramman and Shamask decreed that I make three burned bricks of sixteen finger-breadths in size, and to make an image of burned clay as a charm against disease. And so I made three burned bricks of sixteen fingerbreadths, and an image of baked clay to drive away disease, and I placed it in the foundation. With mortar and burned bricks I erected the main temple mountain high.

O Ninharrak, majestic mistress, when with joy thou enterest Eharsagil, the house of thy pleasure, may words in my favor be ever upon thy lips. Make long my days and establish my years, may long life and abundance of offspring be decreed by thy lips. Give peace to my soul; make my body strong, and make my visions clear. With Marduk, the lord of heaven, command the destruction of my foes, and the ruin of the land of my enemies.

In those days, in the temple of Lugal-Marada, my lord, in Marada, whose ancient foundation no former king had seen since the days of old, I sought its ancient foundation and found it, and upon the foundation of Naram-Sin, the king, my ancient ancestor, I fixed its foundation. I made an inscription with my name, and placed it there.

O Lugal-Marad, lord of all, hero, kindly look with favor upon the work of my hands. Grant as a gift a life of many days, an abundance of posterity, security to the throne, and a long reign. Smite the evil minded; break their weapons; devastate the lands of my enemies. Slay all of them. May thy fearful weapons which spare not the foe be stretched forth, and be sharp for the defeat of my enemies. May they be at my side. Before Marduk, lord of heaven and earth, make my deeds appear acceptable; intercede for me.

PERMANENT SECRETARY FOR NEW YORK STATE FORESTRY ASSOCIATION

Victor A. Beede, formerly Assistant State Forester of New Hampshire, has just been elected as secretary to the New York State Forestry Association with headquarters with the Chamber of Commerce of Syracuse, N. Y.

By employing a man who will give his entire time to the development of the Forestry Association in promoting legislation for the right use of forest lands and for the protection of shade trees of the State, the Executive Committee believes the scope of the organization will be greatly increased.

EUROPEAN LUMBER MARKETS FOR AMERICAN PRODUCERS

We learn that the government intends to co-operate with the lumber manufacturers of the United States in sending abroad a corps of experts to study the condition of European lumber markets with a view to a great expansion of the field of the American producer. This decision was reached at a recent conference which is important in that it marks the opening steps for co-operation between the business men and the government of the United States for the extension of American trade abroad.

At this conference representatives of the government discussed the question with numerous manufacturers and secretaries of lumber manufacturing organizations, including the National Manufacturers' Association, the Southern Pine, California Redwood, West Coast, Northern Pine, Northern Hemlock and Hardwood, and Gum Lumber Associations.

Before taking up the question of how to organize the American lumber industry to best secure the great volume of foreign lumber business that must come to the United States even before the European war ends, there were some detailed reports given of the conditions abroad by the various interested organizations as well as from governmental agencies.

A most illuminating exposition of conditions abroad was made by John E. Rhodes, secretary of the Southern Pine Association, which sent a representative abroad several months ago, and whose reports show that the demand for lumber will be large. France, it was shown, as well as other foreign powers, is strongly prejudiced in favor of American lumber. The plan of rebuilding France, as being outlined by French governmental authorities, is to have towns and villages on the community basis, with model farms on the American plan. Representatives of other lumbering regions agreed that it was time for American lumber manufacturers of all sections to unite to care for this market, regardless of whether the interested districts themselves were exporters or not. This was phrased by Secretary O. T. Swan of the Northern Hemlock and Hardwood Manufacturers' Association.

To secure this foreign business, it was declared to be only necessary for the American lumbermen to go after the trade systematically, with an advance knowledge of the needs of the various nations, and the securing of information as to markets and business practices.

J. M. Pritchard of Memphis, of the Gum Lumber Manufacturers' Association, also gave some interesting comments. He said:

"We have seen the time in our association when our manufacturers were actually selling at a price below the cost of production in order to keep their plants in operation. The extension of the market may not affect gum lumber to any great extent, but it will give the gum lumber manufacturers relief from some of the recent disastrous competition."

The difficulty in obtaining structural steel is said to have caused an increase in concrete construction.



SOME ASPECTS OF MODERN SHINGLING*

DIAMOND SHAPED PANELS—REPAIRING SHINGLE ROOFS—TOOLS USED—STAINING AND PAINTING

By Edward H. Crussell

IN Fig. 56 is illustrated an idea for finishing the ends of the courses at the sides of the gable. Fig. 57 gives another method which is worked in the same manner as the "Boston hip." Fig. 57 shows the edge of the roof finished with a molding, but it may be finished with shingles only, wherever such a finish seems to be suitable. Panels formed of diamond shaped shingles are often used for the ornamentation of gables and, as they are somewhat perplexing to the inexperienced, an effort will be made to explain the working of them. The shape and size of the panel may be varied, but the best arrangement is to make the angle of the panel the same as the pitch of the gable, as shown in Fig. 58. The butts of the shingles, of which the panel is formed, have the same angle as the panel.

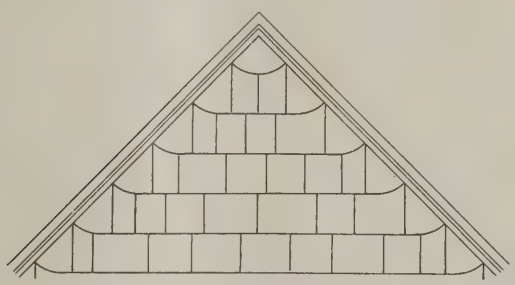


Fig. 56—One Method of Finishing the Courses in Gable Shingling

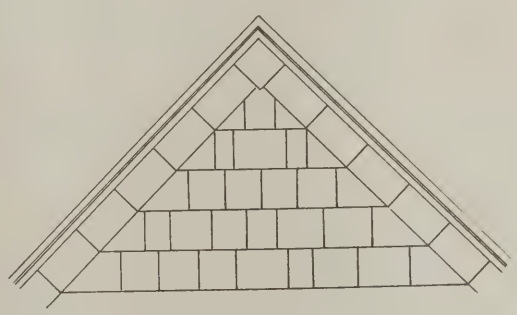


Fig. 57—Another Style of Gable Finish

In working a diamond panel, the plain shingling is finished as far as course "A." Shingle No. 1 is then laid as part of course "B." The shingles 2-2 are laid as part of course "C," and those marked 3 are laid over them. Two narrow shingles are now placed with their butts against the shingles 3-3, as shown by the dotted lines. These narrow shingles form furring strips which enable course "D" to be laid over the shingles 3-3. The shingles 4-4 are laid as part of course "D" and the two shingles next them (in this same course) are beveled on their inner sides. Shingle No. 5 is laid as part of course "E," which also has two beveled shingles and two more beveled shingles in course "F" are laid over shingle No. 5, thus completing the panel. Some workmen instead of using furring strips under course "D" make course "D" a double one. The shingles 3-3-3 then take their place as part of the first of these double courses, and the shingles 4-4 as part of the second. It may help the reader to understand the drawing better if, when he examines it, he remembers that all the shingles in the panel have straight sides.

Small diamonds formed of one large shingle, as shown in Fig. 59, are sometimes used for the decoration of small surfaces, such as the lower portions of bay windows, etc. They are worked the same as the large panels, a furring piece being used under the second course, and the shape of them may be varied to suit the space in which they are placed.

With these various items of ornament used in combination many different designs may be evolved, but the workman should remember to use them in moderation. A small gable finished as in Fig. 55 may appear rather pleasing, but the entire front of a house finished in this manner would, in all probability, be something to make one's eyes ache.

The repairing of shingle roofs is a thankless task, something in which there is little money and neither fame nor credit. Some workmen attempt it by

*Copyright, 1916, by Edward H. Crussell.

pushing new shingles under the old ones—a practice which cannot be too thoroughly condemned.

If the roof is nearly new or if the shingles are in good condition, the easiest and best method of repair is to slip pieces of tin or galvanized iron under the shingles at the point where the leak appears to start. Finding the leak is often the hardest part of the work. It will always be above the mark on the plaster but how far above it is not easy to tell. The water may run several feet along the underside of the roof boards, or along the rafters, before dropping onto the ceiling.

The pieces of tin do not need nailing. They should be shoved under the shingles as far as they will go, or until they hit against the nails, and should be completely hidden by the shingles when they are in place. Use plenty of tins, one above the other, and if you run short, cut a few more out of tomato or coal-oil cans. The writer once tore off an old roof in which was hidden a wheel-barrow level full of these coal-oil-can-tin-shingles.

If the roof is an old one and the shingles are in poor condition, it is a waste of time and materials to try to repair it. Still, in the execution of orders, it often has to be done and where such is the case it is just as well to try to make your efforts look like something.

How often have we seen a man potter around for an entire day on an old shingle roof, putting in one shingle here and two shingles there—on the go all the time and using perhaps, three-fourths of a bundle of shingles in the eight hours.

If you tear shingles off at all, tear off enough to use up half a bundle or more in one patch. You can lay the half bundle in about the same time that you can the two or three odd shingles. You are more likely to catch the leak; both the "boss" and the owner are better satisfied with your work, and all at the cost of a few extra shingles.

Fig. 60 illustrates a tool that is sometimes used for taking off old shingles when doing repair work. It is manufactured especially for the use of slaters, but the carpenter, if unable to procure one at the hardware store, can easily make, or have one made, out of a piece of flat steel. The writer, however, prefers to use an old hand saw. Many workmen nowadays file a few metal cutting teeth on the back of their hand saw, as shown in Fig. 61. This portion of the saw they use for testing suspicious situations and for cutting nails; it is also useful for taking off old shingles in repair work.

The nails in the last course of shingles in a repair patch must show to the weather. Some writers advocate nailing the shingles close up to the butts of the shingles in the course above and then driving the lower course under the upper one until the nail heads are hidden.

If you think a shingle that has been nailed and then driven out of place is in any better condition than one with two exposed nail heads, the writer cheerfully grants permission to any one who desires to try the nail hiding experiment.

Considerable discussion has been expended upon the subject of dipping or painting shingles. Practically everybody is agreed that it is better to dip them before they are applied, than to paint them afterward, some going so far as to say it is better to leave them bare than to paint them after they are in place. The writer is of the opinion that the climatic conditions of different localities have some bearing upon this topic, but that where expense is of no moment, dipping the shingles before they are laid is the proper treatment.

Shingles already dipped, of some twenty-five different shades and colors, can now be obtained from manufacturers, and they have practically superseded the old method of hand and tub dipping in many localities.

Dipping the shingles for a large size roof and stacking them around to dry is something of a job

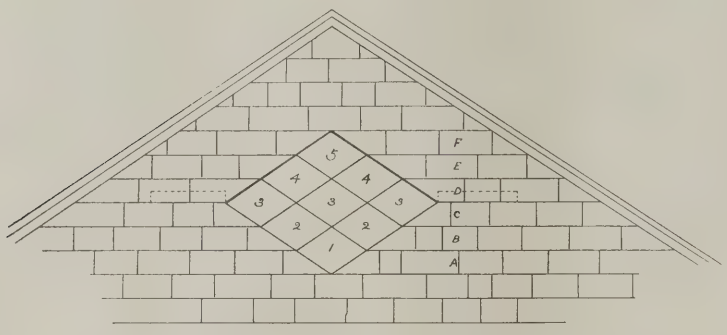


Fig. 58—Showing How to Form a Diamond Panel in a Gable

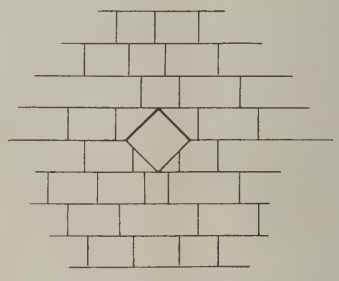


Fig. 59—A Small Diamond Formed of a Single Shingle



Fig. 60—A Slater's Tool Used for Ripping off Shingles

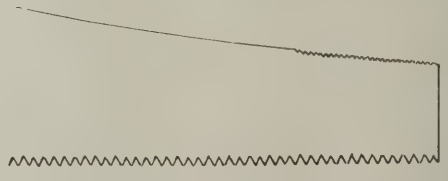


Fig. 61—A Saw with Metal-Cutting Teeth Used for Cutting Nails

in itself, and when this is taken into consideration with the extra cost of getting the shingles onto the roof, it is easy to see why this method is costly.

The writer recalls one job where the architect's idea was to color the shingles four or five different shades of green and mix them all higgledy-piggledy before putting them onto the roof. He could not get them mixed to his artistic satisfaction and was the cause of several workmen quitting the job in disgust. The patch work effect of the finished roof was finally toned down somewhat by a coat of stain applied with a broom.

With regard to painting shingles after they are laid, something depends upon the materials used. Much of this after-painting is done for color effects only, the stain or dye that is used having little effect, for good or bad, upon the lasting qualities of the shingles. If a shingle roof has never been painted the painting of it in its old age is not likely to prolong its life to any great extent. On the other hand, if a painted or dipped roof has worn bare or patchy, a coat of paint or stain ought to improve both its appearance and wearing qualities.

In the old days, it was a common practice in some parts to bed roof shingles in lime mortar. This was one of the first jobs the writer had as an apprentice, and that it did not disgust him at once and forever with the woodworker's business is sufficient proof (to him at least) that a woodworker he was meant to be. If you can think of any meaner job for a twelve-year-old boy than laying shingles on a winter's day with his fingers covered with frozen mortar, you needn't tell what it is.

Speaking of cold weather makes us think of the two extremes. We have laid shingles in eastern Canada when the thermometer stood at 13 below zero, and in California when it was 110 above. The latter temperature is the most trying, but only one thing is needed to make either extreme bearable and that is, your absolute need of the job.

The hardships of cold weather shingling may be softened somewhat, by heating both the shingles and the nails—especially the nails. Of course it would be superfluous for me to state that in zero weather shingle nails are not carried in the mouth.

Shingle nailing machines may now be obtained with which, it is claimed, shingles may be easily nailed while wearing gloves or mittens. The writer has never used one of these contrivances but if he had much cold weather shingling to do he would certainly be inclined to give one of them a trial.

A large sunshade fixed to the seat has been used in a few rare cases of hot weather shingling, but its use has not become general; perhaps because its appearance is usually the signal for a lot of cheap wit and ridicule to be leveled at the user.

NEED FOR BUILDING FIREPROOF HOUSES

COMMON SENSE IN CONSTRUCTION— LACK OF POPULAR KNOWLEDGE OF FIREPROOF MATERIALS

THE people of America are, by heredity and environment, a nation of woodbuilders. Our forefathers found here in abundance the easiest workable material in the form of vast virgin forests, and houses and even town halls and churches were quickly constructed of hewn logs. Then came the development of sawmills and woodworking industries, which resulted in frame houses and wood shingles for roofing purposes. The use of burned clay, and cement in its various forms, for home building is a comparatively recent development in the building field, and was the result of a demand for materials of a more permanent and solid nature than wood, says a writer in *Construction.* During all this time very little attention was paid to the subject of safety against fire, and it is only within a very short time that the significance of the fire peril in dwelling-house districts has been given any thought or particular attention.

You may laugh at the statement that we are still a nation of wood builders, and point to row after row of brick houses, stucco houses, tile and concrete houses, to thousands of larger buildings of brick and stone, of steel and tile and concrete and gypsum; and you may say that this is the age of safe and permanent construction, but mark well the fact that not one in ten persons can name two kinds of shingles which will not burn readily, not one person in one hundred ever thinks of connecting frame exteriors and wood shingles of the ordinary house with the possibility of a serious loss by communicated flames; not one person in one thousand knows that shingles of asbestos and cement, clay, tile, slate, steel and asphalt are obtainable at reasonable prices from near-by building material dealers, and, strange to say, lumber yards. Perhaps not so strange, after all, for the lumber dealer is in many cases developing into an excellent salesman for unburnable building materials, and thereby showing sound common sense and the spirit of progress.

This, then, is the average man-about-to-own-a-home. Through no fault of his own he is lacking in knowledge of the subject of safe construction. The very term "building" conjures in his mind the vision of a lumber pile, and the lumber pile, instead of connoting fire danger, to him simply means easily workable material with which he is accustomed to seeing houses built!

The first stirring of a common-sense movement

to make the exterior of homes safe from fire is being felt throughout the country. Straws are beginning to turn to the course of the wind. Here and there small communities are insisting on fire-safe homes. The criminal wood-shingle roof is beginning to come in for its share of unpleasant public attention—towns and cities are legislating against it. Reliable newspapers, ever keen to champion public welfare, are beginning to denounce the wood-shingle roof and the house with frame exterior and inflammable cornices and porches. New forms of unburnable materials, the so-called "substitutes" for the wood shingles, are rapidly becoming popular. The house of brick or stucco or concrete is becoming preferable to frame structures in the public mind. And why?

To a certain extent it must be due to the lesson of burned cities, great conflagrations, many of which started and fed on the wood-shingle roofs and frame exteriors of dwellings until they had reached sufficient magnitude to wipe out the mercantile sections. Again, while it is undoubtedly true that we of America have taken destruction by fire as part of our national existence, still there is a growing realization of the value of conservation, which is evidenced by the continually improving building laws in our great cities. So, too, the spirit of safety is spreading out into the suburbs. The question of an equalizing cost is naturally having a good effect in encouraging the use of masonry walls and safe roofing. Wood in its various forms for building construction has been continually advancing in price, and to a certain extent has depreciated in quality. You do not get to-day the same shingle that the old shingle mill by the river turned out. Asbestos, cement, clay, gypsum, slate, and other unburnable materials, are being put forth in perfected forms and combinations for home building at very little increase on the cost of wood, and offer the strong inducements of permanency and safety and lower cost of maintenance.

When we consider this increased interest in fire-safe home construction, and realize how perfectly it fits in as an all-important factor in the common-sense building of homes, immediately many questions enter the mind of the prospective builder: How much more will it cost? What material shall I use? What kind of roofing? The answer is to be found in the office of an architect who has had experience in planning houses of masonry exteriors and fire-retarding roofs. He may not encourage that type of construction from the standpoint of safety against fire. Unfortunately, there are few architects who do so—yet. Safety is overshadowed by the esthetic sense and allied with the element of high cost in the mind of the average architect.

REGULATION OF SCHOOL BUILDINGS

Laws requiring sanitary conditions in public school buildings have been enforced in forty-four states of the Union, according to a bulletin on "School Sanitation," just issued by the bureau of education of the United States Department of the Interior. Progress in this phase of education has been made almost entirely within the last decade. That the change for the better was accomplished so rapidly was due for the most part to the readiness of each state to profit by the example of the others. A law passed in one extreme of the country to-day is copied within a month or a year by another state perhaps 2000 or 3000 miles away.

In thirty-eight states legal provisions regarding the school site have been established. Nearly all these provisions are statewide in their application and are mandatory in character. Kansas was the first to revolt against the common drinking cup, and since that state started the crusade, thirty others have followed. In the matter of cleansing and disinfecting, slightly more than one-fourth of the states have regulations which control the conditions.

Fire protection of one kind or another is required in thirty-six states. General or special construction designed for fire protection is dealt with in ten states. In ten the necessity for fire-alarm systems and fire-fighting apparatus is emphasized, and in eleven the law requires there shall be fire drills. Less than half the states, according to the bulletin, have any legal requirements on ventilation.

USE OF "ORDERS" IN MODERN BUILDINGS

The Orders are not a structural necessity in modern building design; in fact, architects long ago got over the habit of thinking of columns as supporting features. This attitude dates back to the time of the Romans, who first began to employ the Orders in a purely decorative sense. The Orders as perfected and employed by the Greeks were real structural elements, applied in such a way as to fulfill a function. Present-day designers are apt to talk a great deal about "structural necessities," "form-following function," "the expression of use and purpose," and the like, says a writer in an English exchange. Some even go so far as to say that no feature has a right to exist unless it expresses truthfully a definite structural necessity. Yet all will, without apology, continue to use three-quarter and engaged columns and cornices applied to a wall as purely decorative features, without considering, perhaps, that a column used in this way is structural only when it serves as a buttress, and that its entablature merely helps to weigh it down and aids toward keeping it from overturning.

Projecting porticos are generally useless appendages to the majority of modern buildings, and we are forced to use the Orders for the artistic expression which they so vigorously show forth as decorations, or else let them alone altogether. We no longer think of columns as supports. We do not think of them as being the architecture, neither are we willing to abandon them altogether and fall back upon the thin, liny skeleton of the structure itself. Therefore, we must agree with the point of view aptly expressed concerning the Orders, that "they do not create the artistic effect; they only serve to perfect it."

PROTECTING BUILDINGS FROM LIGHTNING

WHAT AN ENGLISH WRITER HAS TO SAY ON THE SUBJECT—THE PRINCIPLES OF PROTECTION INVOLVED

IT is feared that the protection of buildings from lightning does not receive the attention of those concerned which it deserves. Enough knowledge of lightning strokes to enable one to safeguard a building against them can be learned from nature alone, and the defense of life and property on land and sea from lightning effects rests on this knowledge. To appreciate the scientific requirements for this protection, one must first understand the principles upon which lightning conductors are erected, together with the nature of the danger they are intended to guard against.

CAUSE OF LIGHTNING

A little time before any structure or tree is struck by lightning a quantity of negative electricity will have collected at the ground near to or adjoining such building or tree, caused by a cloud charged with positive electricity passing overhead. The moment these two kinds of electrical charges contained in the cloud and earth have accumulated to such an extent and to such strength that the air space separating them is unable to resist the strain put upon it by these charges, both the positive and negative electricities combine together and burst their way through the air, causing lightning (the lightning strokes being both upward and downward), which, then, is the passage of an electric spark between a cloud and the earth. As two electrical currents always move in the shortest electrical path, all that is necessary for protection is to provide a path from the highest point of a building to damp earth as an easy line of conductor to the electrical discharge, and a correctly erected lightning rod answers this purpose.

THE LIGHTNING ROD

A well-erected lightning rod prevents an accumulation of a charge on the ground, and also the condition necessary for the discharge of lightning from taking place by converting itself into an electric tap, causing the electricity to leak off and pass as fast as it accumulates through the rod conductor and its metallic point. The rod tends to maintain an electrical balance between the clouds and the earth by causing the charge of electricity that accumulates in the ground near its base to be ejected into the air from its metallic point, and also by carrying away and conveying harmlessly to the earth any disruptive discharge that may fall upon the building.

To prevent a large quantity of negative electricity accumulating on the site, says John H. Davies, F. I. S. E., writing in *The Western Mail,* the collectivity of the ground site should be minimized as much as possible by putting as little as possible of metal work, especially iron, upon it, and iron of large surfaces should be used as sparingly as can be in the construction of the building, as lightning seeks it on its way to or from the earth. Lightning also picks the gilding on picture frames, and large pier, wardrobe, dressing table and chimney glasses for its path.

WHERE ROD IS NOT NEEDED

Unless the house occupies an exposed elevated position with reference to adjoining buildings or trees, a lightning rod is not a necessity, otherwise it is, and particularly so if there is a fairly large quantity of metal surfaces attached to or adjacent to it. It also depends whether the house is in a town or in the country. Towns do not suffer much from lightning accidents, due to the fact that the ascension of smoke in a town carries with it the electrical charge acquired from the earth.

It should be noted that the more a structure or object is above the general level the less is the intervening distance between earth and cloud, and consequently the less the resistance offered to the discharge, hence high objects are most frequently struck. The danger of a building being struck by lightning is lessened by building it on a thoroughly dry site, on rock sites where practicable, away from rivers and sheets of water, and by providing it all round with as much paving as possible. No building, however exposed, can be struck by lightning if it is provided with an efficient conductor.

Any great amount of elevated metal work and metallic balconies on the exterior surfaces of the house should be avoided, also copper slating nails, using as little roof lead-work as possible, and avoid masses of metal placed internally in touch with the outer walls. To determine properly upon a defensive measure the surroundings of the house as well as the character and extent of the building should be taken into account.

LIGHTNING AND HOUSE CHIMNEYS

In the case of houses, the chimney stacks are the objects chiefly picked out by lightning, particularly the stack which is mostly used, owing to the ascending smoke and heated currents of air causing rarefaction, and also to the presence of carbon in the sooty lining of the flues. These are excellent conductors of electricity, and in consequence stacks are seldom struck by lightning. Ranges and soot-lined flues are always objects of danger in conducting the electric current.

It is unnecessary to fix a conductor on each of the chimney stacks, as one conductor fixed on the loftiest part of a building protects a conical space (of which it is the apex), having a base radius equal to

the height of the rod. It is only where portions of the building are so far distant from the rod as to be outside this cone of radius that additional rods are necessary, therefore the higher the rod the greater will be the space protected. Where it is impracticable to have the lightning rod of such an altitude as would form the apex of a cone which would inclose within its area all the points of the building, additional rods should be fixed. As a precaution, however, each chimney stack could, with great advantage, be surrounded by a copper band and connected together by means of a copper tape conductor carried along the ridge and joined to the main conductor.

THE POINT OF THE ROD

The summit point of the rod should be 6 in. long and of pure copper, made sharp at its extreme end, and kept sharp. However, if it is rendered too sharp, in the event of a discharge being too strong for the carrying capacity, such a point would be fused. The point should be widened out to about ¼-in. diameter toward its bottom, and gilded over, this terminal to project about 5 ft. above the highest chimney, and screwed and well-soldered to the top of the rod, using resin only to make the solder flow. The stalk rod should be a tape of copper, ¾ in. by ⅛ in., containing 93 per cent of pure copper in it. It should be attached to the wall by copper clips (insulating supports are unnecessary) every 5 ft., carried outside the building, away from water or gas pipes, and as straight as possible to the ground, with perfectly-made joints These joints are of great importance to prevent resistance to the passage of the electricity.

CONNECTING METAL SUBSTANCES

Any metal substance, either external or concealed, situated near the rod should be metallicly connected to the rod, otherwise, should lightning strike the rod, it may leave the rod to pass on its course by any metal that may be near, as lightning seeks out metallic substances which are near the point toward which it travels. Allow for expansion and contraction, to prevent the joints from being broken and the wall clips becoming loose. Tar or paint the whole of the rod. Carry the lower end of the rod not less than 2 ft. below ground and 10 ft. away from the house, and rivet and solder well its lower extremity to a copper plate 1/16 in. thick and 2 ft. square, but not less than 3 ft. super, the joint between the two to be tarred. Cover the plate and connection with coke to prevent corrosion.

Upon the earth connection the efficiency of the rod mainly depends. The plate must be embodied in either permanently moist earth or water, and the rod should be taken deep enough into the ground to reach very damp earth, and if the quantity of moisture be found deficient there are other means of accomplishing the desired end in a simple manner: only an examination of the site can best determine this. If it is determined to fix the conductor to the chimney mostly used, form a band of copper surrounding the top of the chimney, so that when the wind blows the column of ascending smoke and heated air from the terminal, the band of copper will intercept the lightning and carry it to the lightning rod.

A good means of protection and a substitute for a lightning rod is to use the eaves gutters and downpipes as a lightning conductor by soldering a strip of metal across all their joints, and carrying an iron rod from the same to the highest point of the building, terminating with a sharp point and its lower end connected with moist earth.

In conclusion, unless all these conditions are faithfully fulfilled, lightning rod is a source of danger rather than of protection, as a building fitted with a lightning rod is more liable to attract lightning than those without them. A well-constructed lightning rod may be grasped with impunity while the top of it receives a violent flash of lightning, and every exposed elevated building should be fitted with one. The cost depends on the particular circumstances of the case.

TENEMENT HOUSE CONSTRUCTION IN NEW JERSEY

Plans for 102 new tenement houses and alterations to 48 existing tenement houses at an approximate cost of $701,126 were approved during the month of November by the New Jersey State Board of Tenement House Supervision. These buildings will furnish accommodations for 642 families.

Essex and Hudson Counties will contain most of the new buildings. Newark with 10 buildings costing $59,000 and East Orange with 3 buildings costing $49,000 are the active sections of Essex County. Jersey City with 8 buildings costing $157,000 and West New York with 6 buildings to be erected at a cost of $106,000, lead all other localities in Hudson County.

Atlantic City builders will erect 4 tenement houses, furnishing living accommodations for 56 families and costing approximately $110,000.

Other counties in which tenement houses will be located are Bergen, Camden, Cape May, Middlesex, Morris, Passaic, Somerset and Union.

SMALL BRICK HOMES IN WASHINGTON

Small, moderate cost homes are extremely popular in Washington, D. C., and a new home development scheme has been started at Fifteenth and Webster Streets, N. W., to meet the demand. The operation consists of six and eight-room houses which are 20 ft. wide and 40 ft. deep, and which are faced with buff brick.

The smaller houses contain three rooms and reception hall on the first floor and three rooms and bath on the second floor. The interior finish of each is mahogany and flat white. A feature of the bathroom is overhead ventilation by means of a skylight. A sleeping porch is provided for each house. The cellars have both a front and a rear entrance, the one in front being provided with an outside space for the storage of garden implements.

SLATE AND TILE ROOFS IN ENGLAND

SOME COMMENTS ON THE SUBJECT WHICH MAY PROVE OF INTEREST TO AMERICAN BUILDERS

By John Y. Dunlop

At the present time, in England, every house has a tile or slate roof, which is due to the many advantages of tile-making in England and also to the many slate quarries roundabout. These slates are commonly known as Westmoreland slates, although they may be quarried in that country or in those neighboring. Welsh slates are considered to be among the best quality in England, although they vary considerably in color—red and purple; gray and purple; green, blue, dark blue, and even black. Some of the black slates are of a poor quality and stand only a few years' exposure. Perhaps it would be too broad a generalization to say that all dark or black slates are bad, but they are certainly not above suspicion.

Slates must be laid in such a way that wind and rain cannot pass directly between them. To attain this object the slates, in alternate courses, are laid to break bond, and the lower part or tail of the slate in any course above the two lowest must overlap the head of the course next but one below it. This overlapping is clearly shown in the line illustrations, and is called the lap to which the slates or tiles are laid. In the case of ornamental courses the lap counts from the lowest point of the slate, providing the pattern slate is of symmetrical outline.

With pattern slating, all the slates on the pattern course are the same width. This differs somewhat from common slating, for we find that in that class of work, after the slates are classed according to their length, they are set in position regardless of their width. Of course the joints are lapped, but there is no attempt made at keeping the perpendicular, that is the perpendicular joints, immediately above each other.

This is one of the points which must be regarded carefully in setting ornamental courses, each point of the pattern slate being exactly over the joint in the course underneath.

Before the slates are laid they must be holed for nailing, each must have one or two holes and are either bored near the tail or just a little bit above the middle of the length.

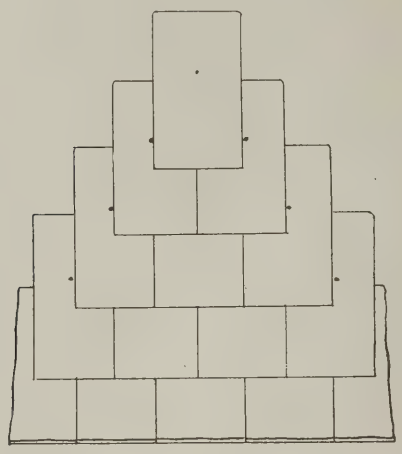


GATE LODGE WITH PLAIN AND ORNAMENTAL COURSES IN SLATE ROOF COVERING

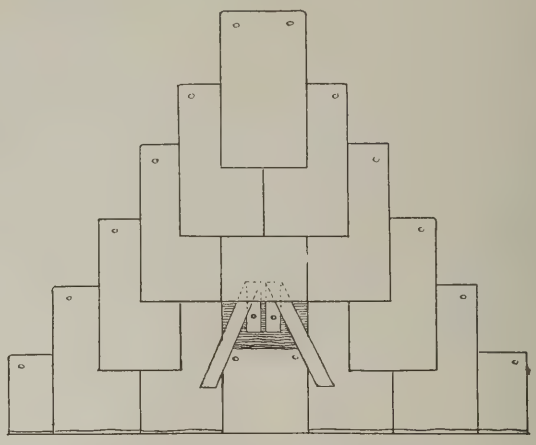
This latter method which is boring for center nailing is often objected to on the ground that moisture may be driven through the nail hole and that the nail hole being so much nearer the lower end of the slate than by the other method, the nail may be injured by the moisture. None of the objections is of much importance. Still, in practice in our district we do very little center nailing, the most of work being specified to be nailed near the tail.

Single nailing and double nailing is other important point in slating. There is no doubt that a double-nailed slate is more securely fixed than one with a single nail. But the difficulty of repairing a double-nailed slated roof has caused many to pause before adopting this method. On the other hand, a single-nailed roof can be easily repaired at any damaged part by simply turning round the slates immediately above, taking out the broken part, replacing with a new slate and turning those disturbed into their original place.

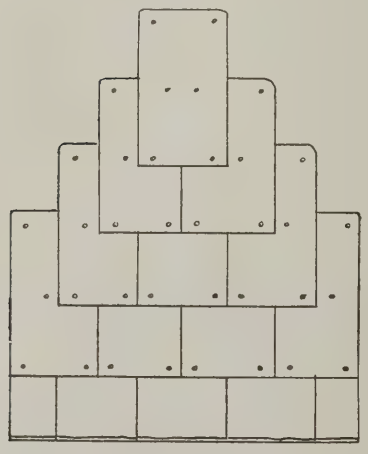
With a double-nail roof the course immediately



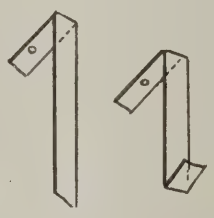
Center Nailed Slating



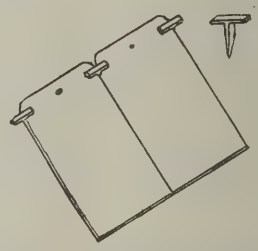
Repairing Roof Where Double Nailed



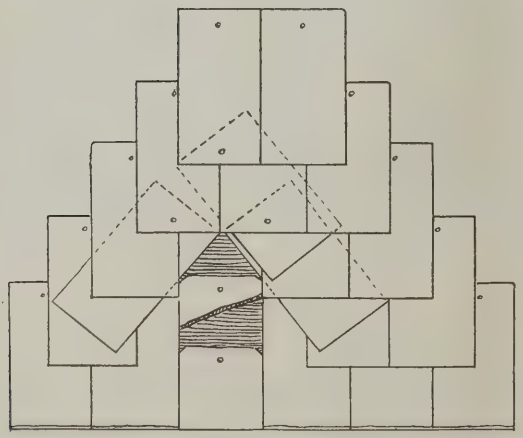
Double Nailed Slating



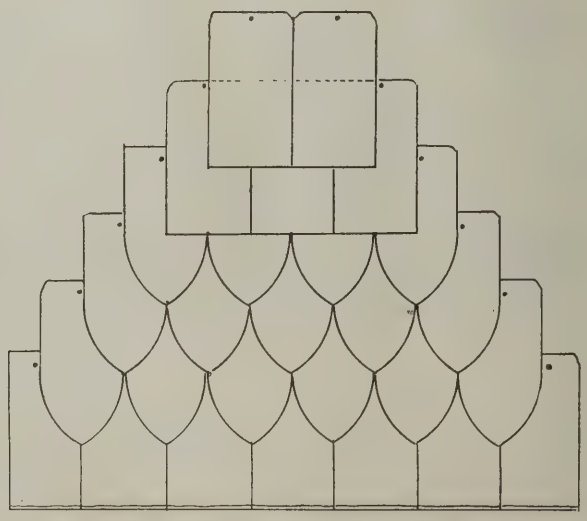
Views of Copper Tingles



Double Nailing with Tee Nails



Repairing Roof Where Slate Are Single Nailed



An Example of Ornamental Slating



A ROW OF WORKINGMEN'S COTTAGES WITH TILE-COVERED ROOFS AND DORMERS

above the damaged part cannot be disturbed, with the result that to remove the top part of the broken slate we must use a long ripper to take out the nail. Then copper tingles are fixed to the exposed part of the boarding. The lower slate is slipped in between the folds of the tingles and nailed at each side so as to be clear of the joint on the course above. The two slates in the next course are slipped in position and the end of the tingles turned up to hold the new slates in position.

With repair work of this kind there is a good amount of labor and if there is any traffic on the roof we could expect in a short time to have a good number of copper tingles to supply. Where building laws required at one time that roofs should have slates double-nailed, they have now almost been withdrawn and in their place we find that they only ask for the third or fourth course to be done in that way. The result of this is that roofs done that way have this course specially well secured and the arrangement allows the roof to be easily repaired.

The exact distance of the hole from the tail of the slate is important, with the result that in the



A SEASIDE BUNGALOW WITH TILE-COVERED ROOF AND WALLS

holing of full-sized slates very often a jig is fixed to the front of the boring machine so that each hole will be a given length from the tail. When undersized slates are being used the slates as they come from the quarry are holed at a distance of one inch from the top, and after that they are sized out in their different lengths, measuring from the lower edge to the nail hole. The longest slates are used for the lower courses with the diminishing lengths nearer the ridge.

In England, slates are laid either on battens or on boarding and sometimes on battens nailed to boarding. For common work the battens are nailed and helps to preserve the wood and slates from decay.

The slater proceeds with his work by nailing a tilting fillet along the eaves of the roof. This is necessary in order to give the slates that slight variation from the slope of the roof which is required to allow them to bed close to each other throughout their length. If the tilting-screed or its equivalent were omitted the tail of each slate would stand clear of the slate below and the wind and rain would find an entrance and might indeed strip off the slates.

The first course of slates must be shorter than



WORKMAN'S COTTAGE WITH SLATED ROOF AND ORNAMENTAL TILE IN GABLE

to the rafters, and if these are not more than twelve inches apart, the laths are not more than 1½ in. by ¾ of an inch thick. The laths are spaced according to the size of the slates and the lap.

For a really dry house and a more uniform temperature boarding covered with felt or waterproof paper is used instead of battens. The boarding is usually ⅝ of an inch thick tongued and grooved to prevent warping and nailed to the rafter horizontally. The slates are nailed directly on to the felt, but a better plan consists in nailing battens on the top of the felting. The space thus formed between the sheathing and the slates keeps the roof warmer the ordinary course by the amount of gage to which the slates are laid. The gage of slating as of tiling is the amount of the slate exposed in each course.

All slates are secured with nails, which may be 1½ or 2 in. long, according to the thickness of the slates, and may be of copper, zinc or composition. Copper nails are used for our best work. Roof tiling are of several kinds, the most general used being the plain tile. These are either simple oblongs or shaped on the lower edge and are hung to wood laths or nibs formed on the tiles or by copper and galvanized iron nails. The usual color is deep red, but other colors can be obtained.



THE OHIO STATE BUILDING RESTING ON BARGES AND BEING TOWED DOWN SAN FRANCISCO BAY

MOVING A BUILDING WEIGHING 800 TONS

FLOATING A HUGE STRUCTURE 30 MILES ON BARGES — DETAILS OF THE WORK

WHAT may be described as one of the most novel feats of house moving ever carried to a successful conclusion was the transportation of the Ohio Building—one of the largest and most imposing State buildings at the recent Panama-Pacific Exposition in San Francisco—a distance of some 30 miles by water to a new site down the bay. The building was 133 ft. 6 in. in length by 85 ft. in width, and weighed about 800 tons, measured by water displacement of the barges upon which it was transported. It was constructed of Oregon pine, was plaster finished inside and out, had four large brick chimneys and massive fireplaces. An excellent idea of the appearance of the



THE APPEARANCE OF THE BUILDING AFTER IT HAD BEEN MOVED FROM THE SHORE ONTO THE BARGES AT THE WATER'S EDGE

building may be gained from an inspection of the pictures presented herewith. The lower one shows the structure just after it had been moved on to the barges, while the upper view shows it being towed by tugboats. A third tugboat, at the extreme right, does not appear in the picture.

The building stood about 600 ft. back from the beach at the Exposition grounds, and in raising the structure from its foundations 170 jackscrews were used. In doing the work, Oregon pine timbers 12 x 12 in. in cross-section were first placed under the sills of the building, lengthwise; then these were crossed with 16 x 16 in. timbers, under which the hardwood shoes and rollers were placed. There were 250 of these rollers, each measuring 8 in. in diameter and made of California laurel. There were six tracks constructed of 12 x 12 in. timbers, these being laid on the ground for the rollers, and the building was pulled by horses hitched to ordinary house-moving capstans.

Each of the two barges measured 140 ft. in length by 36 ft. in width. Level ways were built at the out-shore end of the framework shown in the lower picture of this article, and were held in place by tons of broken concrete. The barges were floated on to the ways at high water, so that they settled on to them as the tide receded. The barges were lashed together and tracks were built on 16 x 16 in. timbers across the decks of the barges, and the building was rolled on to them while they were resting on the sunken ways.

The barges were towed to the ways at six o'clock in the evening, and a large force of men worked all night rigging the pulling gear and making final arrangements before the turn of the tide.

In pulling the building on to the barges—which, by the way, occupied just one hour and twenty minutes—use was made of six coils of 4½-in. manila rope rove through 36 pulleys making three separate tackles of 12 parts each. Two capstans were used on each tackle, and six horses. At high tide the barges floated and were towed to the transport dock, where they were moored until the next morning, when they were taken in tow by three gasoline seagoing tugs and transported to San Carlos Harbor, 30 miles down San Francisco Bay, where the building is to be utilized as a clubhouse by the San Francisco Peninsula Club.

The idea of moving the Ohio Building was first conceived by W. L. Woosley of San Carlos, who called in the services of Captain R. F. Hurlbut, an engineer and builder of San Francisco.

After plans were perfected the contract for moving the building was given to Herbert L. Hatch, 4439 Geary Street, San Francisco, Cal., who carried the work to a successful conclusion. Our readers will remember that he was the contractor of another house-moving operation which we illustrated, the house being raised on cribbing in the street sufficiently high to allow cable cars to operate beneath without interruption.

Mr. Hatch states that the Ohio Building is probably the largest and heaviest piece of freight ever transported on salt water. The moving operations were superintended by A. W. Davis of 179 Fourteenth Avenue, San Francisco. The unloading was practically the reverse of the loading operations.

MEMBERS OF BUILDERS' EXCHANGE TO RENT EQUIPMENT

According to one of our English exchanges there is under consideration by the Builders' Exchange of Montreal, Canada, a scheme by which members who are general contractors may rent to their fellow members surplus equipment. "In these days of dullness in the building trade many contractors have expensive plants which they are perforce obliged to store in yards, entailing a certain amount of cost to look after and also charges in the way of interest on capital. The object is to organize a method by which the various plants can be located in a central yard, and any portion rented to members who require it; or the scheme may be varied by eliminating the central yard, but retaining the idea of renting the equipment. This could be done through the secretary of the Exchange, who would be supplied weekly with lists of the various surplus equipment of the contractors.

"In the case of a contractor requiring a certain piece of machinery, he will get in touch with the secretary of the Exchange and make inquiries as to whether such machinery is on any of the lists. In the event of the machinery being available, the secretary will give the member who inquires a description and the name of the member who is desirous of letting the equipment. The two parties are in this way brought together, and it then remains for them to settle the terms on which the rental will be made. The scheme is of advantage to both members or firms; the one is saved the expense of purchasing plant which may be required only for a given job, and the other obtains a rental for machinery which would otherwise be idle."

MASTER BUILDERS' ASSOCIATION OF AUSTIN, TEXAS

The leading building contractors of Austin, Tex., have recently effected a permanent organization under the name of Master Builders' Association. The prime mover in the matter was J. C. Eade, a building contractor and superintendent of that city, who, after talking to several of the local contractors, sent out circular letters which called together on Nov. 20 about twenty-five contractors, who met in the Knights of Pythias Hall. On motion made and seconded, John R. Cox was elected temporary chairman, who, after calling the meeting to order, asked Mr. Eade to give a talk on the Quantity System of Estimating and Plans for Betterment of Contracting Conditions. His remarks were followed with keen attention on the part of those present, after which a lively discussion ensued, and a movement for immediate organization was made. This resulted in the organization stated, with twenty charter members.

ARRANGEMENT OF SLIDING GARAGE DOORS*

THE STRAIGHT TRACK RIGHT ANGLE DOOR CONSIDERED AT THIS TIME—VARIOUS DETAILS

By E. J. G. Phillips

A GOOD example of a popular size, one-car garage is shown in Figs. 8 and 9. The building is 14 x 18 ft. long, with an 8-ft. opening in front. The lower part of the building is of brick veneer, while the upper half has a cement pebble-dash finish. A hip roof with wide-spreading eaves contributes to the general neatness of appearance. The opening is closed by two doors, each 4 ft. 2 in. wide by 8 ft. high and 1¾ in. thick, which, when open, occupy positions along the side walls. One door is shown partially open in Fig. 8, and entirely open in Fig. 9.

This well-known type of door is usually called a corner door, or right-angle door, from the fact that the doors, in opening, slide around the corner into a place at right angles to their closed position, as shown on the plans in Fig. 13. The inside elevation, Fig. 10, shows all the hardware required to trim these doors.

The hangers are first attached to the doors by the angle plate, which is made to fit over the corner of the door. The hanger for the back end of the door has four wheels and is provided with an extra long pendant, but the hanger for the front end of the door has but two wheels and a short pendant. The angle plate of the front hangers must, of course, be sunk into the door flush to permit the doors to close tightly together. The front track, which should preferably be in two pieces, should extend entirely across the front of the building. Locate the bottom of the track about 1½ in. above the top of the doors. If necessary to economize in headroom, this may be reduced somewhat.



Fig. 8—A Good Example of a One-Car Garage with a Door Partially Open



Fig. 9—The Same Garage With One of the Doors Entirely Open

Before fastening the track in place, lay it on the floor and locate accurately the point which will be directly over the center of the opening, as shown in Fig. 11. Measure the distance *C* from the front end of the doors to the center of the pendant bolt of the rear hanger. Lay off this dimension on the top of the track. Draw a circle ⅞ in. in diameter over the center of the track at these points. Lay the side track on the floor with one end opposite this circle and let the other end line up with the end of the front track, then extend lines from the side of the circle to the side of the front track at the same angles as are made by the track. Cut notches out of the front track ⅞ in. wide, following the lines laid out. These notches, an enlarged detail of which is given at the right of Fig. 11, are to provide clearance for the pendant bolt of the rear hanger when the back end of the door is closed tightly against the jamb. To locate the notch for a single door, locate the point on the front track in line with which the front edge of the door is to stand and lay off the distance *C* from this point.

Proceed with laying out and cutting the notch as described for double doors. The side tracks are located just above the front tracks and run across the corner of the building. The front end of this track extends into the wall 2 in. It should be noted that the end of the front track for single doors should also extend in the wall 2 in. Support the tracks with brackets two to three foot centers, ac-

*Continued from page 57 December issue.

cording to the weight of the door. Attach the brackets for the front track to the head jamb and front walls but for the side tracks it will be necessary to provide a board to which the brackets can be attached as in Fig. 10.

To operate this door from the inside, two handles are required on each door. Ordinary bow handles are satisfactory. If the bolt illustrated is used, this will take the place of one handle. This door is locked differently from the other sliding doors in that the locks are applied to the back end of the door. For a pair of doors, one door should be locked to the jamb from the inside with the bolt shown at the right of the interior elevation, Fig. 10. This bolt is so designed that after engaging it with the keeper in the jamb, by turning the handle to the right, the door is drawn tight to the jamb, the other door is locked from the outside as shown at the left. The lock is mortised into the jamb and is so designed that when the door is closed the latch is thrown forward and hooks into

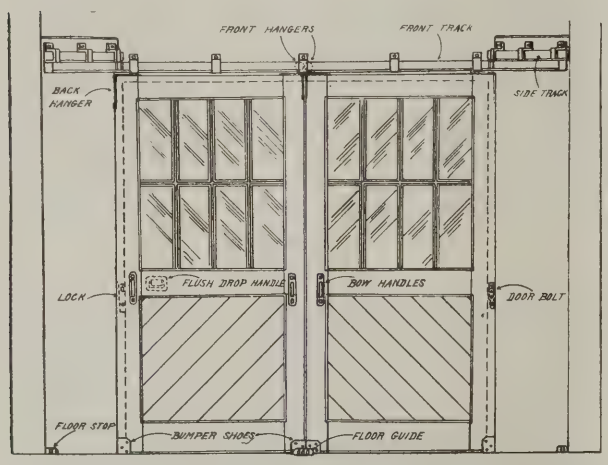


Fig. 10—Inside Elevation of Doors Showing the Hardware Required to Trim Them

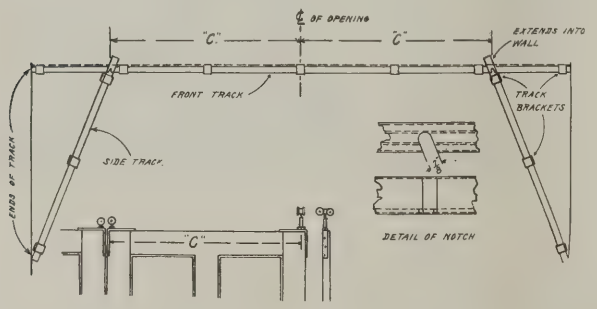


Fig. 11—Details of Track Arrangement

the keeper plate, which is attached to the door. It can then be locked with a key. A detail of the lock is given in Fig. 12. A flush drop handle should be set in the outside of the door on this side in order to draw it shut.

Concrete floors are generally used, and when such is the case, the center floor guide and the floor stops should be embedded in the floor. These are made adjustable for different thicknesses of doors and are used to hold the bottom of the doors in place in either the open or closed position. Steel bumper shoes are used to protect the corners of the doors where they come in contact with the guide and stops.

Fig. 13 shows a number of different plans and partial elevations of doors hung with these fixtures. The first plan, J-1, is a single door two feet from each side of the building. The single

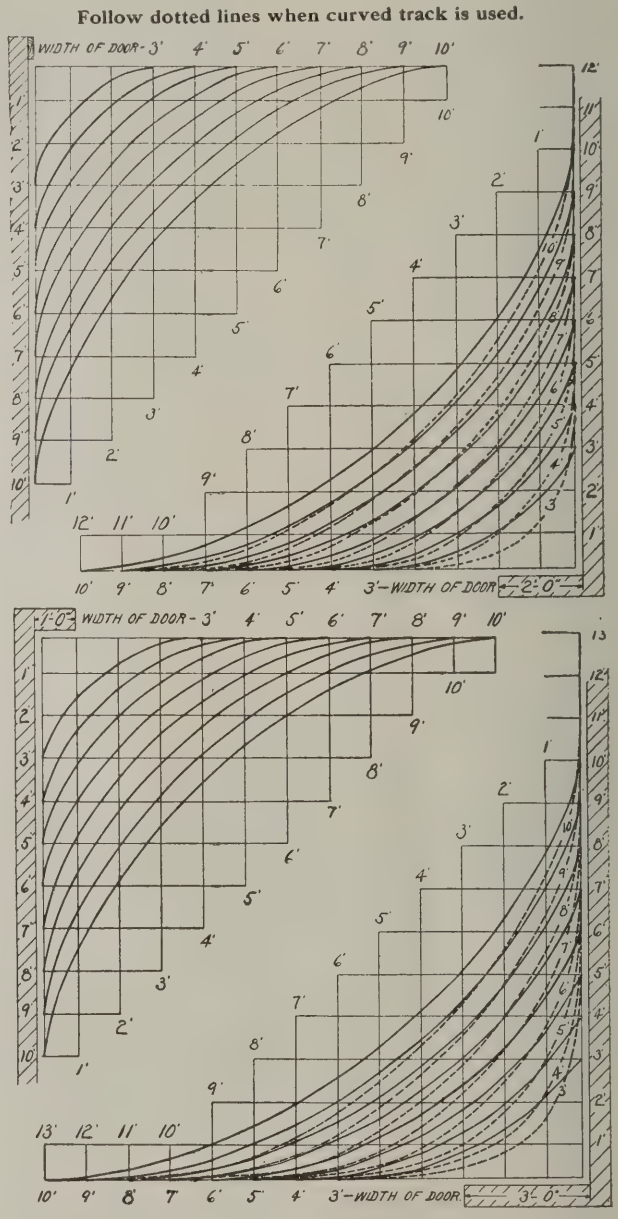


Fig. 15—Diagrams Showing Amount of Clearance Required for Doors of Various Widths and with Different Jamb Spaces

door is hung similar to the pairs of doors described above except that a four-wheel hanger with short pendant is used on the front end of the door. This is permissible, and, as a single door is usually wider than each door when hung in pairs, it is advisable. By referring to the details, the interference of two four-wheel hangers on the front ends of a pair of doors will be evident. The plan J-2 shows a single door directly adjoining the corner of the building. This door is hung the same as the door in plan J-1,

except that both tracks are set at the same height instead of one above the other. This is accomplished by the use of a bracket, Fig. 14, which fits into the corner of the building and is made to receive the ends of two tracks at right angles to each other. The bracket itself forms the end of the track runway. Obviously, the hangers on both ends of the door will then have short pendants. The plan J-3 shows a pair of doors with an adjoining jamb space and J-4 is a pair of doors filling the whole front. The previous description covers the erection of these doors, that is, in J-3 the side tracks are set across the corner and are above the front track, while in J-4 the tracks are all the same height and fit into corner brackets. A combination of a corner door and an ordinary sliding door is given in J-5, while J-6 is a combination of two right-angle doors, one directly adjoining the side of the building and the other with a wall space between the jamb and side wall. The straight sliding door in J-5 may be used as an entrance door. The doors may be fitted very tight to the opening if directions are carefully observed.

The accompanying table provides data valuable to the builder.

Track	Size	Doors	Weights	Headroom With Jamb Space		Headroom Without Jamb Space
				Side Wall Brackets	Ceiling Brackets	Side Brackets Only
31	Small	1¾″ up	300 lbs.	7¾″ to 8¾″	7″ to 8″	5¾″ to 6¾″
232	Medium	2″ up	500 lbs.	10⅜″ to 11⅝″	9⅛″ to 10¾″	6⅞″ to 8⅛″
33	Large	2¼″ up	750 lbs.	10¾″ to 12″	9½″ to 10¾″	7¼″ to 8½″

Fig. 15 shows the amount of clearance required inside the building for doors of various widths and with different jamb spaces. The curved lines indicate the maximum distance to which any part of the door, when being opened, will enter the room.

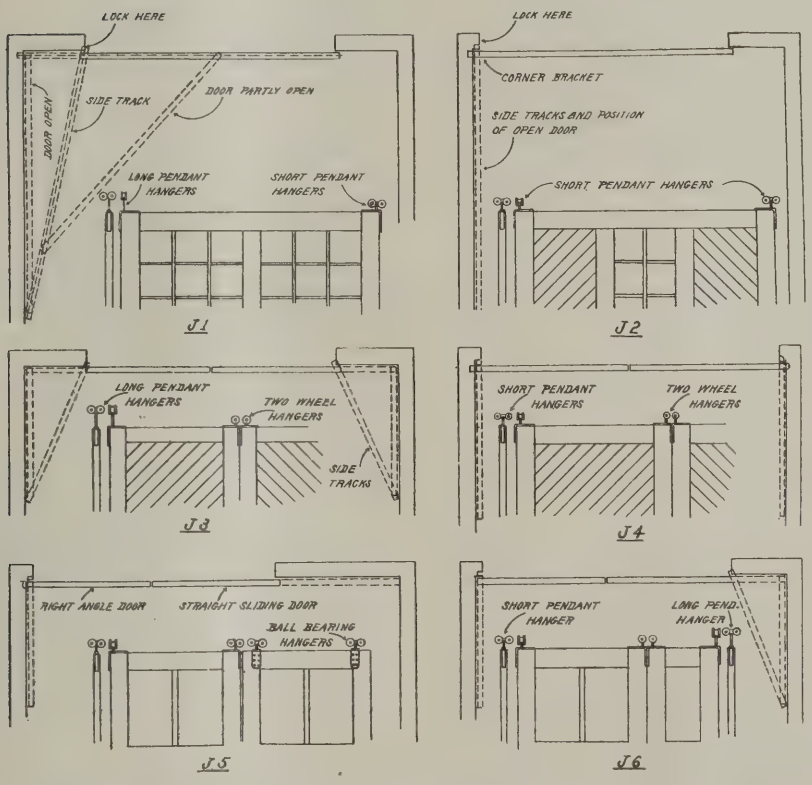


Fig. 13—Plans and Partial Elevations of Doors Hung with Fixtures Described

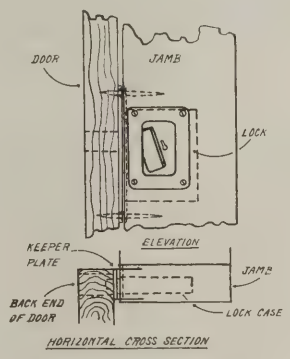


Fig. 12—Details of the Lock

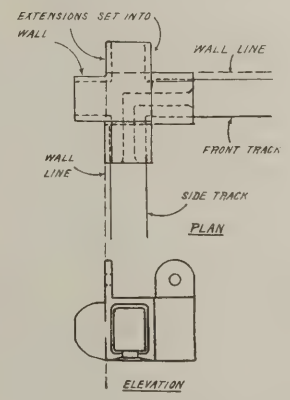


Fig. 14—Details of Bracket Used to Receive Ends of Two Tracks at Right Angles to Each Other

(To be continued)

The typical Colonial stairway consisted roughly of a flight containing two-thirds the total number of steps necessary to reach the second floor, then a landing and lastly a flight containing the remaining one-third of the number of steps. This arrangement made it easily possible to place a door under the landing. A Palladian window was often so placed as to open on the landing.

A COUNTRY HOUSE FOR A SMALL FAMILY

AN ATTRACTIVE COTTAGE OF SEVEN ROOMS AND BATH—VARIOUS DETAILS OF THE CONSTRUCTION



WE have taken for the subject of our colored supplemental plate this month an attractive cottage of stucco finish and having a shingle roof, the front slope of which is broken by a rather ornamental dormer window. Other noticeable features are the pergola-treated veranda extending entirely across the front of the house; the porch at the side entrance, the roof of which extends to the rear sufficiently to cover the breakfast nook of the kitchen; and the broad overhang of the roof at the gable ends. The light cream tint of the stucco exterior forms a pleasing contrast with the stained shingles of the main roof and porch.

THE SITE

The cottage has been designed for a plot of ground measuring 40 x 100 ft., and is to be so placed as regards points of the compass as to give a southern and western exposure to the living room, as well as the western sun to the bedroom on the main floor. The plan is compact, and is intended to afford accommodations sufficient for a family of four people.

The feature of the main floor is the living room, in one corner of which is an open fireplace. The chimney is so placed as to serve not only the living-room fireplace but also the furnace and the kitchen range. At the right of the fireplace is a seat which abuts the main flight of stairs leading to the second story. These are lighted by a window as shown in the colored picture and in the gable elevation. Beyond the living room are kitchen and bedroom, with bathroom between, and so placed that one line of plumbing supplies the kitchen and bathroom fixtures, thus resulting in economy of construction. On the second floor is a large bedroom and a storage room.

THE FOUNDATIONS

According to the specifications of the architect, all foundation walls and footings are to be of concrete, the walls to be 8 in. thick, and supported on footings 10 in. deep and extending 6 in. beyond each side of the wall above. All concrete is to be mixed in the proportions of one part cement to three parts sand and five of broken stones.

The chimney is to be built of brick, starting from a concrete foundation, and to contain three flues lined with vitrified flue lining. The chimney, above the roof line, is to be finished with stucco.

There is to be a cellar under the entire house containing furnace and storage rooms. It is to be reached by a flight of stairs under the main flight and beginning at a point near the side entrance door and convenient to the kitchen.

THE FRAMING TIMBERS

The framing timbers are to be of spruce and of the following dimensions: The corner posts are to be 4 x 6 in., the plate 4 x 6 in., laid flat, the girders 4 x 8 in., the first and second tier of floor beams 2 x 8 in., all placed 16 in. on centers; the second-floor ceiling beams 2 x 6 in., and placed 20 in. on centers, with all tiers of beams strengthened with one row of cross bridging. The studs are to be 2 x 4 in., placed 16 in. on centers and doubled at all openings. The rafters are to be 2 x 6 in., and placed 20 in. on centers.

The entire frame of the building is to be covered with 1 x 9 in. hemlock sheathing boards, over which is to be placed a layer of good building paper, and upon this, in turn, are to be placed 1 x 2 in. furring strips spaced 16 in. on centers to receive the metal lath to which the exterior stucco is to be applied. The roof is to be covered with red cedar shingles exposed 5½ in. to the weather, and all shingles to be stained when applied.

THE OUTSIDE STUCCO

The exterior stucco is to consist of two coats, the scratch coat to be at least a half inch thick outside of the lath surface, and is to be mixed in the proportions of one part cement to three parts sand, and not more than 10 per cent lime putty. The first coat is to be applied under pressure and to be well scratched before it sets. The finish coat is to be at least ¼ in., and to consist of one part cement, two parts clean, sharp sand and three parts of pebbles for rough finish. The stucco is to be tinted a light cream color.

The exterior cornice, rails, brackets, trim, etc., are to be of white pine. The floors in the rooms of the first story are to be double, the sub-flooring to consist of 1 x 9 in. tongued-and-grooved hemlock, and the finish floor of ⅞ x 2½ in. No. 1 pine. All attic flooring is to be ⅞ x 4 in. pine.

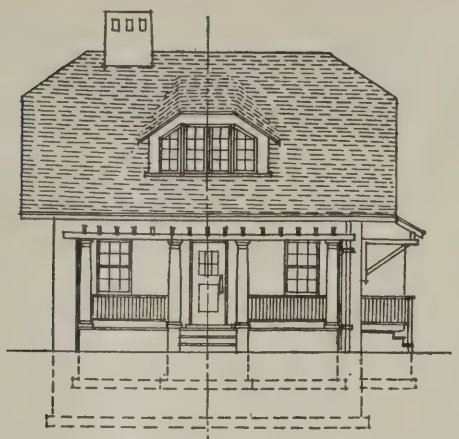
THE INSIDE TRIM

The trim and doors of all the rooms are to be of cypress, and are to be stained and varnished.

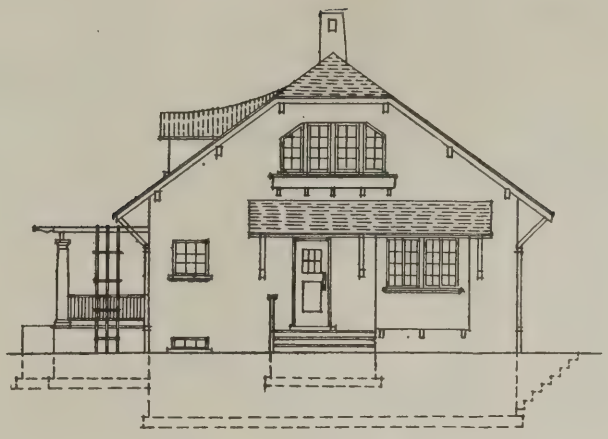
The walls of the living room are to be paneled with narrow strips of wood, the panels being left in a rough plaster finish, while the walls above the paneling are to be finished smooth. All trim of this room is to be cypress, stained and varnished, and the plastering is to be tinted. It will be noted from inspection of the floor plan that the living



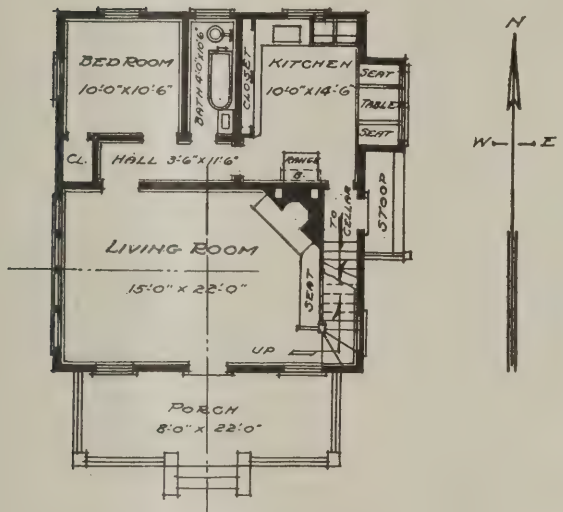
BUILDING AGE
NEW YORK



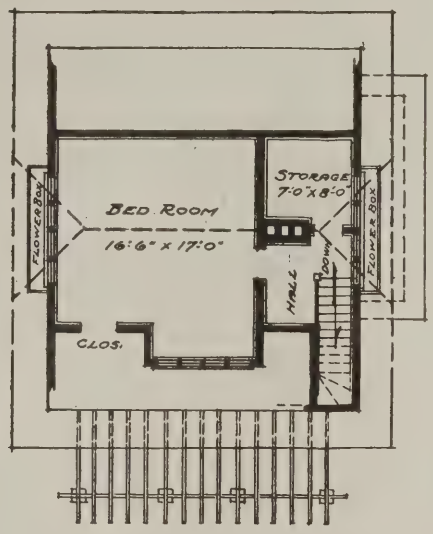
SOUTH ELEVATION



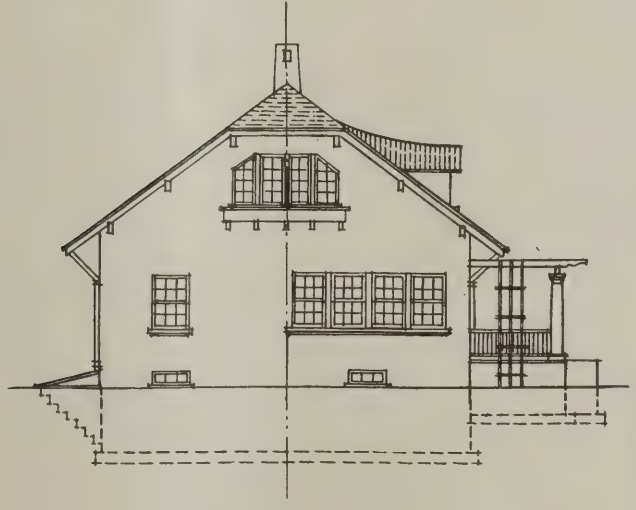
EAST ELEVATION.



FIRST FLOOR PLAN



ATTIC FLOOR PLAN.

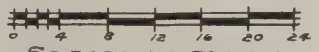


WEST ELEVATION



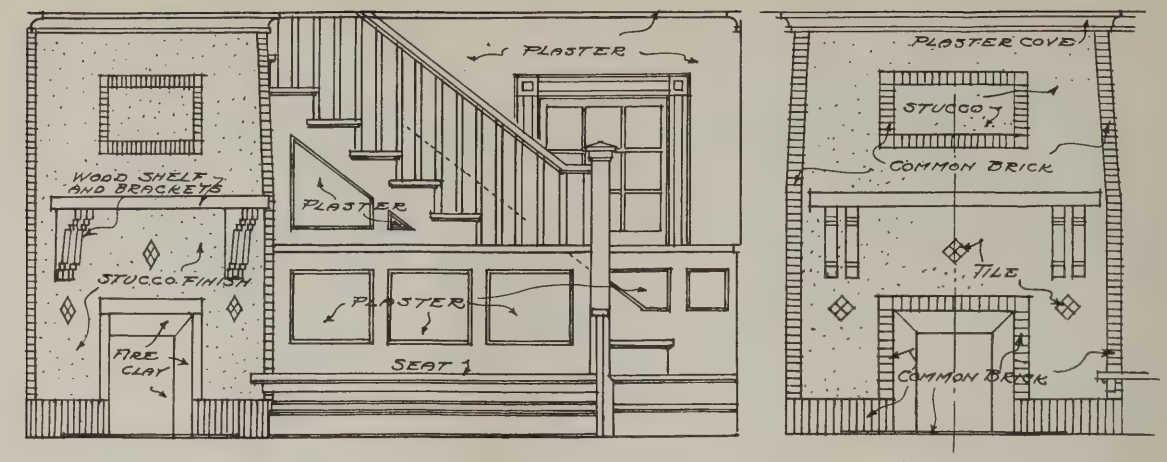
NORTH ELEVATION

ARTHUR WEINDORF, ARCH'T.
LONG ISLAND CITY, N.Y.

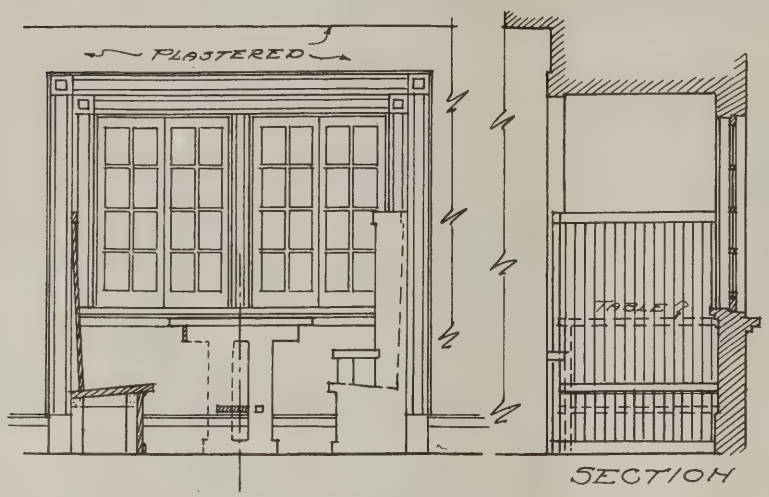


SCALE IN FEET.

PLANS AND ELEVATIONS OF SMALL COUNTRY HOUSE SHOWN ON SUPPLEMENTAL PLATE

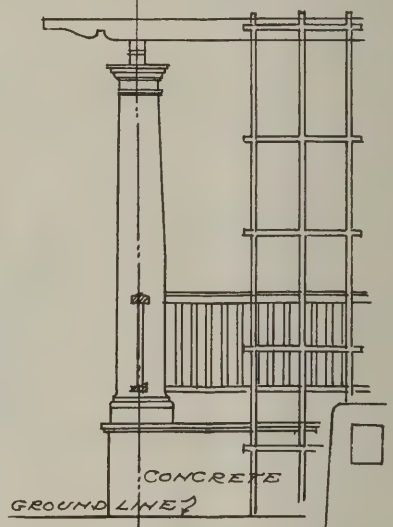


✧ DETAIL OF FIREPLACE SEAT AND STAIRS IN LIVING ROOM. ✧

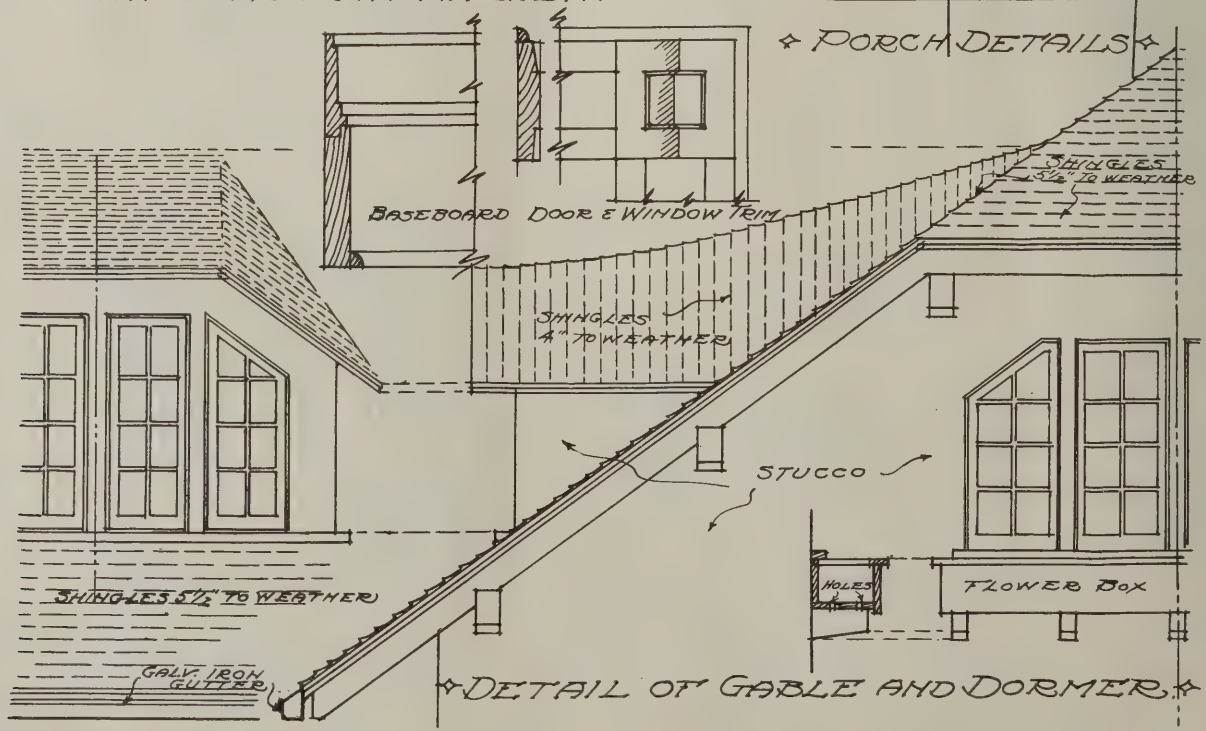


SECTION

✧ DINING NOOK IN KITCHEN. ✧



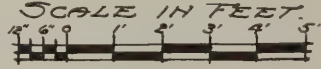
✧ PORCH DETAILS ✧



✧ DETAIL OF GABLE AND DORMER. ✧

ARTHUR WEINDORF ARCHT.
LONG ISLAND CITY. N.Y.

SCALE IN FEET.



DETAILS OF THE SMALL COUNTRY HOUSE SHOWN ON THE SUPPLEMENTAL PLATE

room communicates with the kitchen and bedroom on that floor by means of a private hall.

The kitchen is of good size, and is conveniently located with regard to the cellar stairs and outside entry. A dining nook is a feature of the kitchen, and occupies the extension just beyond the side entrance to the house. This will serve as a great convenience, and in a measure as a substitute for the dining room. The walls of the kitchen, as well as of the bathroom, are to be given a coat of waterproof paint, and all trim and doors are to be stained and varnished. The walls of the bedroom on the main floor are to be tinted, the trim stained and varnished, and the ceilings left white.

All rooms on the first and second floors are to be plastered and given a hard, smooth finish, except the panels in the living room, which are to be finished as already specified.

A good system of plumbing is to be installed, with simple fixtures, using a galvanized-iron enameled sink, a two-part wash tray of soapstone or enameled iron, and a hot-water boiler of galvanized iron over the range. All plumbing work is to be exposed and all the rough pipes are to be painted. The plumbing of the bathroom is to consist of an iron enameled bathtub, water closet with china bowl, and a washstand with a marble top and a china wash basin. The exposed pipes are to have a nickel-plated finish.

The hardware throughout the house is to be of a bronze plate finish and is to match the registers and lighting fixtures. The lighting is to be by means of electricity, and the living room is to contain one drop pendant of three lights.

The house is to be heated by hot-air furnace, with registers located in all rooms except the kitchen, and are to be of such finish as will match the hardware in design. The heating system is to be of such capacity as to properly heat the building in zero weather.

All sheet-metal work is to be painted on both sides before it is placed, and leaders are to be of galvanized iron.

The architect states that the cubical content of the cottage here illustrated and described is 20,799 cu. ft., on which he places a unit price of 12¼ cents per cubic foot. These figures, however, do not include the contractor's 10 per cent profit. Some of the principal items of estimated cost, as given by the architect, are $150 for masonry work, including concrete foundation walls and footings, $135 for chimney and brick work, $500 for the lumber, $300 for the mill work, $580 for the carpenter labor, $130 for the exterior plastering, and $115 for the interior plastering. He also allows $180 for the plumbing, $120 for the hot-air heating, and $115 for the painting.

The cottage was designed by Arthur Weindorf, Long Island City, New York, or care of THE BUILDING AGE, 50 Union Square, New York City.

A FEW HINTS FOR THE HOME BUILDER

PRACTICAL DETAILS CONNECTED WITH HOUSE BUILDING WHICH SHOULD NOT BE OVERLOOKED

BY F. H. SWEET

THE cellar excavation should extend 12 in. beyond the foundation to allow for pointing the wall on the outside. The space should be filled with sand or gravel, to drain the foundation. The cellar should have 8 ft. headroom. A house on a level requires 2½ ft. of underpinning above grade, and hillside houses should not have less light and air area than this.

The foundation trench should be 2 ft. below the cellar, reaching stone, if there be any, though the trench will be widened to allow room for the mason. Rough field stone wears better than brick. Foundations should be laid in cement mortar, smoothed and thoroughly pointed inside and out, to repel moisture and vermin; the dry stone wall is almost worthless. The thickness depends on the weight and on climatic conditions. For example, in New York and Boston the wall is 20 in. thick, but in Maine foundations are 3 ft. at the bottom, tapering to 24 in. The inside may be lined with brick, presenting an even surface with the inside of the underpinning, and may be tied into the stonework with irons. A footing course should project several inches underneath the foundations, according to superstructure and soil (6 in. projection and 1 ft. thickness is an average size). The simplest and cheapest footing course is loose stone laid dry. This drains off water. If the house is of brick or stone, the footing is of regular stones, each the full width of the wall, drained by a porous pipe outside the footing. The top of the footing should be 6 in. below the cement bottom.

All stonework should be well bonded with the courses breaking joints. To tie the wall firmly together, set frequent headers crosswise of the wall.

Cement for below ground should consist of one part best cement, two parts clean, sharp sand, mixed fresh as required. A weaker mixture is one part lime, one part cement, two parts clean, sharp sand.

Concrete should consist of one part best cement, two parts clean, sharp sand, three parts screened pebbles. Lay 4 in. thick, finishing with a skim coat of cement. A floor drain may be laid around the wall. Mortar for exposed work is best made of

one part best cement, one part lime and two parts clean, sharp sand.

The underpinning is usually of brick, laid close, with struck joints, and each sixth course laid as headers. Brick piers are usually built in the cellar, resting on stone footings below level, and having iron caps. Iron posts are sometimes substituted, and 4-in. iron piping has served satisfactorily in light structures.

DETAILS OF FRAMING

The important work of framing the house has many details, but the same main principles. Spruce is commonly used. In the braced frame the sill is usually 6 x 8 in. set in from the face of the underpinning. It should be bedded in mortar. Sometimes it is anchored to the foundation with bolts built into the wall. Commonly the intersecting angles are halved together, and a mortise cut through for the tongue of the post. The halved sill is spiked together and the post secured by a wooden pin through sill and tenon. The ordinary post is 4 x 6 in., but preferably made of a 4 x 8-in. and a 4 x 4-in.

The sunk girt, to receive the ends of the floor timbers, is framed into the post and pinned. The raised girt, level with the top of the floor timbers, is likewise framed into the post. Both girts are commonly 4 x 8. The top plate is not less than 4 x 6, halved at the angles, and mortised to receive the post. It may be of 2 x 6's. The braced frame can stand alone, the braces holding it rigid. Made timbers must be lag bolted when they have to stand the strain of framed-in braces. The ledger board, supporting the attic floor timbers, is of 1-in. stock let into the inner side of the studding.

THE STUDDING

Window and door studs are usually 4 x 4's framed into the horizontal timbers. The head stud (at the top of an opening) should be framed in as the tie beam of a miniature truss, helping to support other timbers and prevent sagging. The sill stud should be secure. A piece of board under each end, nailed to the frame stud, with common studs between, will serve as support. Common studs, 2 x 4, are seldom framed in. If they are, the mortise should be slight. In the made sill the mortises can be cut before spiking. In large houses common studding may well be 2 x 5, and other sticks correspondingly enlarged. Studs are commonly set 16 in. on centers, or for rigidity, 12 in. These spacings are imperative, as laths are 4 ft. long.

The balloon frame is not self-supporting. The studding runs continuously from sill to plate. Often only temporary braces are used, the outside boarding holding the frame. Yet in the best work the long brace is used. Posts should be mortised into sills and sustained by stays. Window and door studs are 2 x 4s, one on each side, mortised into sill. Common studs are spaced and held by braces. First-floor timbers are set and floor laid to work on. The false girt (or ledger board) is then let into the studs, second-floor timbers put into place, and floor boards laid loosely. The uprights are then made the height of the plate, which consists of a 2 x 6 timber nailed across the top with another upon it and joints at corners. Attic floor timbers are laid on the plate; a ledger board can be employed if a higher attic story is desired.

The long braces are now set in place and securely spiked at all bearings. They are of 2-in. stock, as long as possible, let into the outside of the frame. In the balloon frame, unless window and door openings come above one another, the framing becomes weak and complex. Prior to boarding in, see that timbers are trued. Straighten by diagonal temporary braces on the second and third floor timbers, or from the floor directly to the timbers. Outside boarding, and under floors are diagonally laid; braced partitions, and partition feet and heads assist in bracing. The diagonal boarding gives most effectual bracing. Its direction should change repeatedly to gain strength.

THE FLOORING SUGGESTED

The ordinary floor timber is 2 x 10. Lower floors find support on girders and basement piers; other floors must be self-supporting. Be sure a floor is strong, as sag and jar loosen the plastering and strain the frame. Deep timbers are best. The following rule may be over strong, but it is a good one to err by:

For a 12-ft. space 2 x 10-in. spruce timbers, set 16 in. on centers and cross-bridged two to three rows, should be used.

For 12 and 15-ft. spaces 2 x 10-in. spruce timbers, 16 in. on centers, should be used, every other one consisting of two timbers spiked together, cross-bridged three or four rows.

For 15 to 20-ft. spaces use 3 x 12-in. Southern pine timbers, 16 in. on centers, crowned (bowed upward from ends to middle to take up sag) ½ in. cross-bridged four to six rows.

For 20 or 25-ft. spans use 3 x 14-in. Southern pine timbers, 16 in. on centers, crowned 1 in. for a length of 25 ft. and cross-bridged six to eight rows.

Floor timbers are "sized", or notched, on to end bearings at the bottom to bring tops level. Straight edges should be on top; if they have none, discard them. They are framed upon sill and girder, their points of bearing nearly at the same level. Floor timbers are cross-bridged at intervals of 6 ft. or less. One-by-four strips, crossing in continuous x-fashion, are set between timbers, forming a stiffening that distributes the weight.

(To be continued)

Kenosha, Wis., is enjoying a building boom which is said to necessitate the erection of 400 homes, estimated to cost $1,000,000, for workers who are pouring into the place to take advantage of industrial conditions.

According to the United States Department of Agriculture about 700,000,000 feet of timber were cut on the national forests in 1915.

ICE-HOUSE AND COLD-STORAGE INSULATION

SOME TIMELY SUGGESTIONS AND DETAILS OF CONSTRUCTION RELATING TO BUILDINGS OF THIS NATURE

INQUIRIES are constantly being received as to the construction of small ice-houses and cold-storage buildings, special stress being placed upon the proper insulation of the walls, etc., together with the general arrangement of parts, in order not only to conserve the ice supply, but also, in the case of cold-storage rooms, to preserve the contents placed within. Some very interesting and valuable information along this line is found in bulletins which have been issued from time to time by the United States Department of Agriculture, and which, therefore, should be regarded as authoritative in all respects.

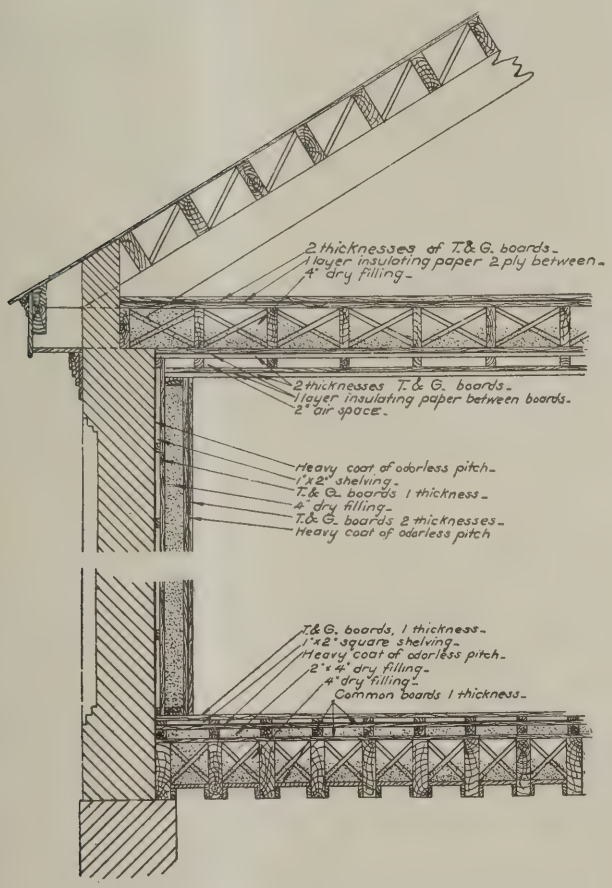


Fig. 1—Partial Section of Building Showing Insulation where Neither Sawdust nor Shavings Are Used

In order that ice be kept from melting rapidly it must have a minimum of surface exposed to the air or to the packing material. This is most easily accomplished by piling the ice in the form of a cube. The claim is made that a mass of ice 12 x 12 x 12 ft. exposes less surface than the same tonnage piled in any form which less approaches that of a cube or globe. Obviously, one of the most important features of ice-house construction is proper insulation of the walls, for upon the completeness of this depends the satisfactory keeping of the ice. Drainage is important because the lack of it interferes with the insulation. The ice itself must be packed so as to prevent as completely as possible the circulation of air through the mass. The more nearly the mass of ice approaches that of a solid cube, both in shape and texture, the easier, with good drainage and insulation, will be the keeping problem.

In Fig. 1 of the sketches is presented a vertical cross-section of a portion of the walls, floor and ceiling of a house for storing ice without the use of sawdust or shavings, the outside walls being constructed of brick. The inside surface of the brick wall is given a heavy coat of odorless pitch, and to the walls are fastened 1 x 2-in. furring strips running horizontally. To these are fastened tongued-and-grooved boards 1 in. thick; then there are 4 in. of dry filling, and then a wall of 2-in. tongued-and-grooved boards treated with a heavy coat of odorless pitch. This makes, in reality, a double wall, with an air space between the 4 in. of filling and the outside brick wall.

The floor is built on much the same general plan, the various details being clearly indicated in Fig. 1. Such a house is more particularly adapted for the storage of blocks or cakes of ice of irregular form and thickness, which renders them more difficult to pack in a way to prevent air spaces which may form air passages and thus cause rapid melting. Irregular blocks are less easily insulated than regular cakes of uniform size and thickness.

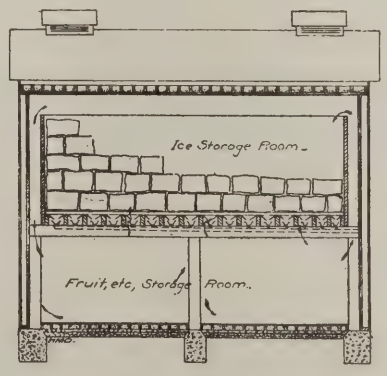


Fig. 2—Vertical Section of a Cold Storage Building Showing Internal Arrangement

In many sections of the country small cold-storage buildings are utilized to good advantage, especially in the farming districts, where it is desirable to store fruit, vegetables, and other products, through a period of time. Where the structure is for combined ice and cold storage, the ice chamber

will, of necessity, be much larger than when the ice is used merely to lower the temperature of the house at harvest time, and where the supply is retained in a building intended solely for the storage of ice, and from which it is taken as the necessities of the case demand and placed in the cold-storage building. In Fig. 2 is shown a vertical longitudinal section of a building designed to store the ice above and the fruit or other products below. Of course, this arrangement may be modified so as to adapt the building for either use. If, however, the object is especially that of fruit storage, the ice chamber may be so reduced as to serve merely as a bunker in which to place a quantity of ice at a time and to be replaced as needed.

Fig. 3 represents details of insulation and construction of the building shown in Fig. 2. Here the slat floor is built of 2 x 4-in. Georgia pine,

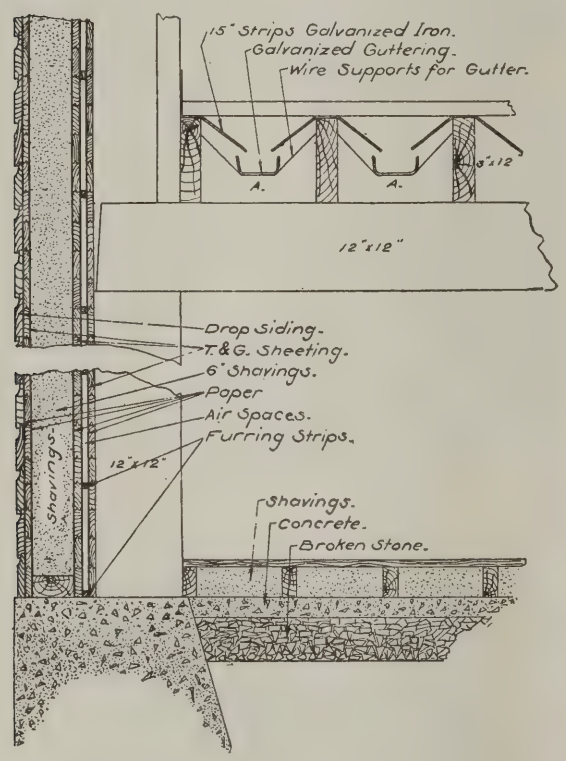


Fig. 3—Details of Insulation and Construction of Building Shown in Fig. 2

supported on 2 x 12-in. or 3 x 12-in. joists, according to the requirements of the case. The joists are protected by a cap of galvanized metal 15 in. wide, tacked to and formed over the top of the joists prior to laying the slat floor, so that the drip from each metal cap may be caught by the line of gutter *A*, which is suspended between the joists. This is one of the simplest types of floor construction for this style of structure.

It will be seen that the outside wall is double, and filled with shavings. On the inside are air spaces which tend still further to insulate the wall. The floor is of concrete resting on a bed of broken stone. On the concrete are floor joists supporting a wooden floor, the space between the joists being filled with shavings.

STRENGTH OF STONE UNDER STRAIN

The strength of a stone is the measure of its capacity to resist stresses of various kinds. It depends partly on the rift of the rock and on the cleavage and hardness of the grains, and partly on the state of aggregation, including degree of cohesion, interlocking of grains, and nature of cementing material, if such is present. Although strength alone is not a sure criterion of durability, a knowledge of the capability of any stone to withstand stresses of various kinds is of value if the material is to be used for purposes involving extraordinary strains.

Many tests have been made of the strength of building stones, says a writer in an exchange. It was early learned from these tests that most stones have many times the strength required for ordinary uses. As pointed out by Buckley, ordinary building stones have 2 to 10 times the crushing strength required in any structure for which they may be used. As a consequence of a recognition of this fact, there was a reaction against making tests, which were regarded as superfluous. An increased demand for strength in structural stone and a wider knowledge of the significance of strain resistance has led to a renewed interest in strength tests.

It is known that stones are less durable when exposed to intense strains, and it seems reasonable to conclude that the rate of disintegration increases with proportional rapidity as the strain to which the rock is subjected approaches more and more nearly to the ultimate load it is capable of bearing. Rock strength may, therefore, have a decided influence on the rate of disintegration, even when it is evident that the strength is far in excess of the requirements.

UNIQUE FEATURE OF CHICAGO APARTMENT HOUSE

A rather unusual apartment house is planned for Chicago, Ill., the feature consisting in the fact that, although the building is to be only six stories high, it will contain no more than four apartments. The first floor is to be devoted to an entrance hall, entertainment room, retiring rooms, service kitchen, storerooms, janitor's flat, chauffeurs' rooms and garage. The top floor will contain a roof garden, guestrooms, outside sleeping quarters and baths. Each of the apartments is to contain thirteen rooms and four baths.

The building will occupy a lot 60 x 170, but will only cover a depth of 157 feet. It will be of reinforced concrete and cost $175,000.

An ingenious arrangement which makes use of the ice water that comes away from the icehouse for cooling milk in the dairy is possible by designing the dairy with a concrete cooling pit in one corner next to the icehouse. The water in the cooling pit can be kept cold by this method. The size and arrangement of the dairy room will have to conform to the amount of milk produced, but it need not be large or over one story high.

THE CONSTRUCTION OF HOUSE CHIMNEYS

THE PROPER SHAPE AND SIZE TO MAKE THE FLUES—HOW THEY SHOULD BE BUILT

By W. H. Hefelfinger



ONE of the most important features of a dwelling house is chimneys that will perform their functions as they should. A troublesome chimney is an abomination. Draft in a flue is caused by the air in the stove, furnace or fireplace becoming heated and then rising. The hotter this air becomes, the greater is its velocity in rising, but this velocity is also dependent upon a number of other things which I shall explain in this article.

First is the shape of the flue. Fig. 1 illustrates the three principal shapes of flues. Circular is the best shape because air and gases in ascending do so in the form of a spiral and there are no corners to retard their velocity. Then it also requires less material to build a circular flue than any other shape of equal area. Circular flues are not used very much except in large stacks, but sometimes circular flue lining is used in square chimneys.

Square flues, the second best, are the most used, being the easiest to build with brick, and then in most localities flue linings are made square and

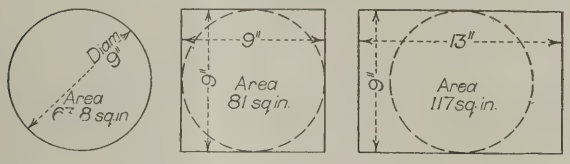


Fig. 1—Three Shapes of Flues with Diagrams Showing that a Square is no Better than a Circle and that a Rectangular One is not Much Better than the Circle that May be Inscribed in it.

rectangular, which of course work best with square and rectangular brick chimneys.

A rectangular flue is not economical, its effective area being not much greater than that enclosed by the largest circle that could be inscribed in it. Flues that are more than 4 in. greater one way than another are especially bad.

The inside surface of the flue may influence the velocity of the draft as any rough places, projections or holes retard it. This surface should be smooth and even as possible, which is one excellent reason for using flue linings. These flue linings should be set in cement mortar and joints finished smooth inside. Flues should be straight for best draft, but sometimes they are given a bend to avoid down-drafts and rain falling in. If bends must be made in a flue, as is often necessary, be sure and see that the size of the flue is not decreased at that point. Carry one side up two courses at least more than the other. Fig. 2 shows the right and wrong way of drawing over a flue. A bend of this kind is always a bad place to clog up, so particular care should be taken to keep it open or make provision to clean it out.

The height of flues is another point that is a source of considerable trouble, especially in causing a stove to smoke. The greater the height the greater the velocity. Sometimes a flue may be plenty high to draw but smokes occasionally when the wind is in a certain direction. The cause of this is that some part of the building or an adjoining building is higher than the chimney.

Fig. 3 illustrates how high flues should be built on different pitch roofs. If a small building is built alongside of a large one and it is impossible to carry the chimney high enough to avoid down-drafts, they can be avoided by the use of a cowl. Draft may also be considerably affected by trees, but this seldom happens.

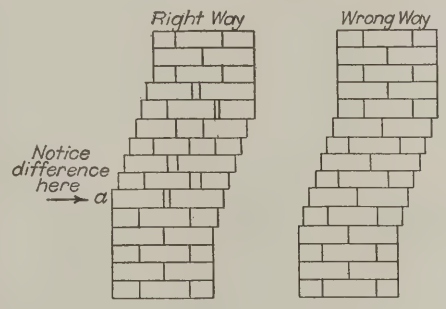


Fig. 2—The Right and the Wrong Way of "Drawing Over" a Flue

Materials for flues consist principally of cheap brick, in dwelling houses, laid up in lime mortar, and the number of fires caused by defective flues show the fallacy of this. In good work hard brick and cement mortar should always be used, especially in topping out. One place in particular that I would always advise hard brick and that is in the attic between the roof and the second or third floor. This part of the chimney is very seldom plastered and is in a dark, out-of-the-way place and no one ever sees it to tell what condition it is in. Salmon brick deteriorate very rapidly in places like this and leave large holes in the chimney. I have repaired flues where you could sit in the attic and watch the sparks go up the chimney. In old houses I have always found this to be the weakest place in the chimney. All flues should be lined with flue

lining for best results as far as draft, fire protection and lasting qualities of flue.

Pargeting or plastering of flues as practised in the country and small towns is only a makeshift and the difference in cost is pretty cheap insurance.

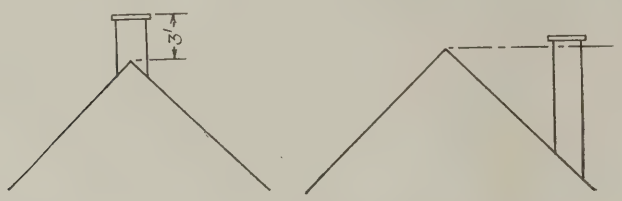


Fig. 3—Showing the Minimum Height of Chimneys in Order to Secure the Best Results

In large flues it is best to have a hollow wall as the heat from the furnace causes the material of which the flue is built to expand and crack, which damages the chimney and spoils the draft. I know of one heating contractor who always advises circular flue lining and hollow walls around the base of large flues, but he does good work—work that always gives satisfaction.

The thickness of the walls of flues is generally regulated by the building laws of a city, but in small towns and the country, the contractor uses his judgment. Four-inch walls are heavy enough for all small flues provided they are lined with flue lining. In cold climates the outside wall flues should be 9 in., especially for fireplaces, as the cold air chills the brick, which cools the air and decreases the velocity of the draft.

The best location for a flue is in the center of the house or away from the outside wall. The walls of the flue are not then cooled by the outside air and any heat given off by the flue helps to warm the house. One of the most important points in building a flue is to build it large enough, but not too large. Be sure the cross sectional area of your flue has the necessary square inches. A chimney built of two bricks on a side will, with ordinary hard brick, should have a flue area of 9 x 9 in., but plaster the inside of the chimney with ⅜ in. of mortar and your cross sectional area has been reduced 13 sq. in. or about one-sixth. If flue lining was used, the inside dimensions are reduced to 7 x 7 in. or a reduction of 32 sq. in. in area, or about two-fifths of the original area. This reduction of area is important and a good many people fail to realize it. Fig 4 illustrates this point. Flue lining for a 9 x 9-in. flue only measures 8 x 7 in. inside; for a 9 x 13-in. flue it measures 7 x 11 in., and a 13 x 13-in. flue only 11 x 11 in. Take a fireplace for instance, where the area of the flue should be at least one-tenth of the opening; if the opening is 3 x 2 ft., the area required in the flue would be 72 sq. in., which would require a 9 x 13-in. flue with flue lining as a 9 x 9-in. with flue lining would only give 49 sq. in. and a 9 x 13-in. would give 77 sq. in.

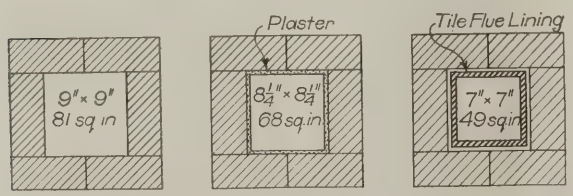


Fig. 4—Showing How a 9 x 9 In. Flue May Become a 7 x 7 in.

In topping out chimneys a reinforced concrete cap or stone cap set in cement mortar is one of the best methods of finishing a chimney, as it holds it together and keeps the weather from beating out the mortar in the joints. Never allow any woodwork to come in direct contact with any wall of a flue, especially near the first floor.

HOW TO BUILD A BUNGALOW

A correspondent of THE BUILDING AGE, who evidently has a comical streak in his make-up, sends the following squib, which we present for the entertainment of the reader:

There is probably no one in this world who has not at some period in his career desired to own a bungalow. A bungalow is a long, low, rakish-looking house, with a porch in front and an ash can behind. You get into it by going on your hands and knees, and you crawl out backward, for there generally isn't room inside to turn around without upsetting two or three hundred dollars' worth of furniture.

One way to build a bungalow is to follow the advice of the enthusiasts. According to them, you can build a bungalow for any price from $4.50 up to $3,000,000, and you can go a little higher than the last-named figure if you want to have plumbing in it. The usual recipe for a $4.50 bungalow is about as follows:

Lumber	$1.01	Tin work	.65
Brick	.39	Heating	.39
Paint	.10	Extras	.29
Carpenter work	.71		
Plastering	.96	Total	$4.50

Of course, it can be done a little cheaper by leaving off the roof and side walls, but it seems as though any one ought to be able to afford a bungalow at the figure named. We have a friend who is building one of the $4.50 variety after one of these recipes. Up to date, it has cost him only $8,796.53, and it is nearly half done.

ORGANIZATION OF NEW ORLEANS BUILDERS' COUNCIL

The organization of the Allied Builders' Council of New Orleans, La., is now consummated, and quarters have been taken in the building of the Contractors' and Dealers' Exchange, under whose aupices the movement was launched. The purpose of the organization is to protect the public from evils which may result from incorrect information, improper conduct and unscrupulous intent in the various fields of building activity.

EXHIBITORS AT THE COMING CEMENT SHOW

CONCERNS LIKELY TO DISPLAY PRODUCTS OF SPECIAL INTEREST TO OUR READERS

THE coming Cement Show to be held in the city of Chicago, Feb. 7 to 15 inclusive, will be the tenth in number which has been presented, and will be housed under one roof, making necessary the use of the balcony as well as the main floor and annex of the Coliseum. The applications have been such as to insure a gratifying success, and the exhibits as a whole are representative of the cement industry and allied interests to even a greater extent than has been the case in any of the nine previous years when shows have been held. The heavy exhibits will be placed on the main floor and annex, and the lighter ones in the balcony, so disposed as to make an interesting and attractive display.

Among the exhibitors in the Tenth Cement Show whose product is of more or less interest to readers of THE BUILDING AGE, and to whom space has been assigned, mention may be made of the following:

Abram Cement Tool Co., Detroit, Mich.
Aetna Portland Cement Co., Detroit, Mich.
Alpha Portland Cement Co., Easton, Pa.
Amalgamated Roofing Co., Chicago.
American Cement Machine Co., The, Keokuk, Iowa.
American Dump Wagon Co., Cedar Rapids, Iowa.
American Steel & Wire Co., Chicago.
Anderson Meter Co., Duluth.
Archer Iron Works, Chicago.
Architectural Mold Co., Detroit, Mich.
Art Stone Co., Waynesboro, Pa.
Baute Concrete Machinery Co., The, Benton Harbor, Mich.
Blaw Steel Construction Co., Pittsburgh.
Blystone Manufacturing Co., Cambridge Springs, Pa.
BUILDING AGE, New York and Chicago.
Burt Portland Cement Co., Bellevue, Mich.
Byers Machine Co., The Jno. F., Ravenna, Ohio.
Carey Co., The Philip, Cincinnati, Ohio.
Carpenter & Co., Geo. B., Chicago.
Cement-Gun Company, Inc., Allentown, Pa.
Cement Tile Machinery Company, The, Waterloo, Iowa.
Ceresit Waterproofing Co., Chicago.
C. H. & E. Manufacturing Co., Inc., Milwaukee, Wis.
Chain Belt Co., Milwaukee, Wis.
Chicago Cement Vault Co., Chicago.
Chicago Portland Cement Co., Chicago.
Conneaut Shovel Co., The, Conneaut, Ohio.
Crescent Portland Cement Co., Wampum, Pa.
Cummings Machine Co., The, Ninster, Ohio.
D. & A. Post Mold Co., Three Rivers, Mich.
Decorators' Supply Co., The, Chicago.
Diamond Portland Cement Co., Cleveland, Ohio
Dixie Portland Cement Co., Chattanooga, Tenn.
Dull Co., The Raymond W., Chicago.
Dunn Mfg. Co., W. E., Holland, Mich.
Eureka Machine Co., Lansing, Mich.
Federal Motor Truck Co., Detroit, Mich.
Foote Concrete Machinery Co., Chicago.
Garden City Sand Co., Chicago.
Garford Motor Truck Company, Inc., Chicago.
Gemco Manufacturing Co., Milwaukee, Wis.
Great Western Mfg. Co., Leavenworth, Kan.
Handy Sack Baler Co., Cedar Rapids, Iowa.
Heltzel Steel Form & Iron Co., Chicago.
Huron Portland Cement Co., Detroit, Mich.
Hydraulic Pressed Steel Co., Cleveland, Ohio.
Hydro-stone Co., Chicago.
Ideal Concrete Machinery Co., Cincinnati, Ohio.
Ideal Engine Co., Lansing, Mich.
Indiana Truck Co., Marion, Ind.
International Motor Company, Chicago.
Ironton Portland Cement Co., Ironton, Ohio.
Jaeger Machine Co., The, Columbus, Ohio.
Kent Machine Co., Kent, Ohio.
Knickerbocker Co., The, Jackson, Mich.
Koehring Machine Co., Milwaukee, Wis.
Kosmos Portland Cement Co., Louisville, Ky.
La Grange Specialty Co., La Grange, Indiana.
Lansing-Company, Lansing, Mich.
Lehigh Portland Cement Co., Chicago.
Louden Machinery Co., Fairfield, Iowa.
Louisville Cement Co., Louisville, Ky.
Marsh-Capron Manufacturing Co., Chicago.
Martin & Bros., C. E., Mansfield, Ohio.
Mays & Talley Co., Chicago.
Michigan Portland Cement Co., Chelsea, Mich.
Miller, A. D., Goshen, Ind.
Multiplex Concrete Machinery Co., Elmore, Ohio.
Milwaukee Concrete Mixer Co., Milwaukee, Wis.
New-Way Motor Company, Lansing, Mich.
Newaygo Portland Cement Co., Newaygo, Mich.
New Egyptian Portland Cement Co., Detroit, Mich.
Northwestern States Portland Cement Co., Mason City, Iowa.
Northwestern Steel & Iron Works, Eau Claire, Wis.
Novo Engine Co., Lansing, Mich.
Oshkosh Mfg. Co., Oshkosh, Wis.
Peerless Portland Cement Co., Union City, Mich.
Peninsular Portland Cement Co., Jackson, Mich.
Pioneer Asphalt Co., The, Lawrenceville, Ill.
Sandusky Cement Co., The, Cleveland, Ohio.
Sasgen Derrick Co., Chicago.
Schaefer Manufacturing Co., Berlin, Wis.
Schlueter, M. L., Chicago.
Silo Specialty Manufacturing Co., Clinton, Iowa.
Smith Co., The T. L., Milwaukee, Wis.
Sonneborn Sons, Inc., L., New York City.
Standard Paint Co., The, New York City.
Standard Scale & Supply Co., The, Chicago.
Staple Post Mold Co., Westerville, Ohio.
Sterling Motor Truck Co., Milwaukee, Wis.
Studebaker Corporation of America, The, South Bend, Ind.
Thomas & Armstrong Co., The, London, Ohio.
Thomas Elevator Co., Chicago.
Trussed Concrete Steel Co., Youngstown, Ohio.
2-E Flexible Concrete Forms, Eagle, Wis.
Union Sand & Material Co., St. Louis, Mo.
Universal Crusher Co., Cedar Rapids, Iowa.
Universal Portland Cement Co., Chicago.
Wabash Portland Cement Co., Detroit, Mich.
Walter Concrete Machinery Co., Inc., Indianapolis, Ind.
Waterloo Cement Machinery Corporation, Waterloo, Iowa.
Wolverine Portland Cement Co., Coldwater, Mich.
Wyandotte Portland Cement Co., Detroit, Mich.

ARCHITECTURE OF THE INCAS

Lack of timber, the prevalence of heavy rains during part of the year, and the ease with which stone might be procured, early led to the development of stone as a building material by the builders of Machu Picchu, capital city of the ancient Incas, says Prof. Hiram Bingham, director of the Peruvian expedition of 1915, in a Bulletin issued by the National Geographical Society, Washington.

Strength and permanence were secured through the keying together of irregular blocks. The upper and lower surfaces of these stones were frequently convexed or concaved, the convexity of one stone approximating the concavity of the adjoining stone. In constructing their walls, the pure arch was not evolved. They developed several ingenious devices, such as lock holes for fastening the bar back of a door; ring stones, which were inserted in the gables to enable the roofing beams to be tied on and projecting stone cylinders to be used as points to which to tie the roof and keep it from blowing off.

Portland Cement Association, 111 West Washington Street, Chicago, Ill., is distributing in pamphlet form a lecture on "Fundamentals of Reinforced Concrete Design," by Ernest McCullough, chief engineer of the Fireproof Construction Bureau of the Association, prepared for the Short Course of Manual Training and Vocational Teachers held at Lewis Institute, Chicago, last summer.

BUILDING AGE

(Founded in 1879 by David Williams)

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Index to reading matter on page 17 of the advertising section of the paper.

JANUARY, 1917

The BUILDING AGE takes this occasion to wish its many friends and patrons a most Prosperous and Happy New Year.

THE BUILDING OUTLOOK

There is a feeling in many sections of the country that most all materials entering into building construction are likely to be fully as expensive next year as they are at present and as a consequence orders are being placed for quantities of materials likely to be needed during the first half of 1917 and even reaching into the third quarter of that year. It is becoming apparent that prospective builders are meeting with increasing financial encouragement to purchase materials even at the high prices now prevailing, but in New York City and vicinity there is a tendency to confine operations quite largely to the remodeling of old buildings rather than to undertake entirely new enterprises. In this way the higher costs of building materials are in a measure discounted. No doubt the high cost of structural shapes may cause some falling off in the erection of towering office and large commercial buildings as well as in apartment houses involving the use of any considerable amount of steel, but taking the country over, the outlook is regarded optimistically in building circles, and reports which are constantly coming to hand show a disposition to plan for construction work with the opening of the spring season upon a scale somewhat in excess of that which has prevailed in the immediate past. This work covers various classes of buildings, although dwelling house construction is probably in the van, due in large measure to the necessity of providing for the steady growth of cities and towns and also to furnish housing accommodations for workmen in connection with some of the numerous industrial plants which have lately enlarged their capacity to a very considerable degree in order to take care of the business which the European war has stimulated to an unusual extent.

BUILDERS AND MOTOR TRUCKS

The advantages of motor trucks as compared with horse teams for haulage purposes are rapidly being appreciated by contracting builders in all parts of the country, as is strikingly demonstrated by the extent to which the former are replacing the latter in all lines of industry. The readers of the BUILDING AGE are obviously interested in this phase of the builders' business, and we are therefore desirous of obtaining as much information along this line as may be possible.

To this end we shall be glad to have every builder, wherever located, send us a photograph of the motor truck he may be using in his business, together with his views as to the advantages resulting therefrom, and any figures of cost which he may have kept covering the operation of the motor truck for a specified time as compared with the expense involved when using horse teams. We are sure that information of this kind will prove very valuable to our readers and especially to the builder who does not at present own a motor truck, but who may be contemplating such a change of motive power in connection with his business.

VALUE OF CALCULATING MACHINES

With the beginning of the new year the progressive and wide-awake builder naturally casts up the figures of his business for the twelve months which have elapsed and considers plans for the year upon which he is now entering. One of the things which has impressed him, as it doubtless has every builder in the business, is the necessity of accurate estimates in putting in bids on jobs, for well he knows that accuracy in estimating is one of the first steps on the road to success. There are two reasons why

it is necessary to be extremely careful in totaling estimates. If a mistake is made that results in the total being higher than it should be, the contractor's chances of landing the job are materially lessened. If, on the other hand, and as is too often the case, the mistake occurs on the wrong side, the probability of securing the work is increased and the contractor will be lucky if he breaks even, depending of course on the extent of the error. A number of instances might be cited where profits and overhead expenses were completely wiped out on certain jobs simply because of inaccurate totaling. One contractor who put in figures on a job found his first item amounted to $1,000. The rest of the first estimate sheet consisted largely of double column figures, and in carrying forward his total he forgot to include the first item. When the job was completed and his costs were checked up with the estimate the mistake was discovered, much to his chagrin. Another man took a contract on which he figured he would make $300 profit, but he discovered after he had landed the job that he had made a mistake of exactly this amount in totaling his estimate.

BUSINESS INSURANCE

In neither case did the contractor own an adding machine, which is a form of business insurance that many in the trade consider indispensable. It is safe to say that in both instances these mistakes would have been discovered in time had the totals been run off on an adding machine and checked up with the estimate sheet. Equipment of this character is inexpensive and those in the trade who plan to establish greater efficiency in the office will find an adding machine a good investment. Costly mistakes also occur that can be offset by such equipment where it is used for multiplication, which is the contractor's tedious job when making up an estimate. While many slip up on addition once in a while, the chances of error in calculation are far greater and less easily detected. Machines can be bought that are practical and rapid on all forms of calculation—multiplication, division, addition and subtraction, and for this reason are especially helpful and efficient in figuring estimates. Contractors owning adding and calculating machines, when questioned how they came to buy them, stated almost invariably that they suffered serious loss on one particular job and were protecting themselves to see that it did not occur again.

THE COMPLETE BUILDING SHOW

Brief reference was made a few months ago to the coming National Complete Building Exposition which is to be held in the Grand Central Palace, New York, March 5 to 11 inclusive, since when we learn that while the home building interest will be sustained as completely as in the initial show held in Cleveland last winter, there will be a radical departure in the addition of special sections for the more general of building operations. These will include special school, theater, church and factory divisions in connection with each of which will be shown the latest improved equipment and materials.

Another feature will be community exhibits by the associations promoting the wider use of metal lath, brick, lumber, cement, tile, gypsum products, terra cotta, and various roofing materials. An important architectural contest is also contemplated and a substantial prize offered for the best plan of a house actually built within the last year at a cost not exceeding $5500. Not only must the plans be furnished, but also a photograph of the completed structure. This will afford the prospective builder definite and convincing information of the kind he is doubtless anxious to secure.

From the interest already manifested, the management of the exposition feels assured of a representation of every class of building material, equipment and furnishing. There will also be in the house furnishing section an extensive display of labor-saving devices for the home and also of various articles which make for greater home comfort.

OFFICERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

At the fiftieth annual convention of the American Institute of Architects, held the first week in December, in the city of Minneapolis, Minn., the following officers were elected for the ensuing year:

President....John L. Mauran of St. Louis
First Vice-Pres...C. Grant La Farge of New York City.
Second Vice-Pres....W. R. B. Willcox of Seattle.
Secretary...W. Stanley Parker of Boston
Treasurer..D. E. Waid of New York City

President Mauran said it was the most successful convention the Institute had ever held. It was decided to change the date of holding the annual meeting from December to some time in the spring.

CONTRACTORS OF THE WORCESTER TILE AND STUCCO HOUSE

In connection with the article in the December issue illustrating and describing the tile and stucco house of F. T. Blake in Worcester, Mass., it should have been stated that the general contractor was Joseph J. Roberts, 4 Wall Street, Worcester, Mass., and the contractors executing the plastering and stucco work were Faucher Bros. & Company, 58 Front Street, Worcester, Mass.

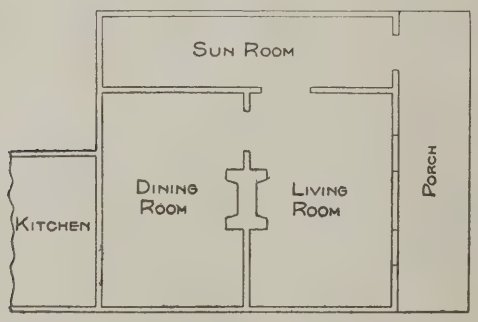
CORRESPONDENCE

A Department Where Those Interested Can Discuss
Trade Topics—Every Reader is Invited to Participate

A QUESTION IN FIREPLACE CONSTRUCTION

From W. F., Anchorage, Alaska.—I would like very much to have some of the practical readers of the paper tell me how to so build a fireplace as to obtain a satisfactory draft. I am constructing for myself a seven-room house with a 12 x 18 ft. living room and expect to use concrete for the chimney with a 5-ft. face in center double flue. I want to build it so I can also have a fireplace in the dining room which adjoins, the two fireplaces backing each other something after the manner shown on the plan sent herewith. The log walls will be 4 ft. high and the first story have a 9-ft. ceiling, while the second floor will have an 8-ft. ceiling. The roof will extend over the sun room.

I would say that the fireplace should be large enough to carry big logs on the fire rack.



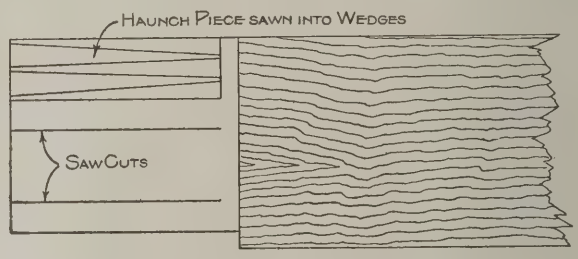
A QUESTION IN FIREPLACE CONSTRUCTION

It might be interesting to some of the readers of the paper to know that our steamship rates are a bone of contention, the charge being $14 per ton from Seattle, $14 per M ft. of lumber with a government lighterage of $2.50 added and hauling $2.50 more, which, it will be seen, makes transportation of materials somewhat expensive.

WEDGING A HAUNCHED TENON

From C. J. M., St. Johns, Newfoundland.—In answer to "W. H. C.," Peoria, Ill., whose inquiry regarding the wedging of a haunched tenon appeared in the November issue of THE BUILDING AGE, I would say that neither of the methods indicated in his sketches is correct. If I were asked the question, Why or for what purpose is the tenon wedged? I would say, to tighten up the joint and to keep the tenon from pulling out. In order to do this, the wedges must be driven in such a way as to make the tenon larger at the outside than at the shoulder. In other words, to give it the form of a dovetail.

Now the method shown in Fig. 1 of the correspondent's sketches, instead of making the tenon larger on the outside would tend to make it smaller. The wedges being driven on each side of the tenon would have no power to draw the joint together, but rather the contrary effect, besides pressing the tenon together and making it narrower outside. It is, therefore, obvious that the method is faulty and incorrect.



WEDGING A HAUNCHED TENON: FIG. 1—METHOD SUGGESTED BY "C. J. M."

Of his Fig. 2, I would only say that it is incorrect on account of the wedge room being cut out of the tenon instead of out of the mortise, thus giving the wedges very little effect in spreading the tenon.

It was the practice with hand workers, when I was a bench hand, after the shoulders of the tenon were cut, to mark out the width of the tenon, and before cutting off the haunch to rip it into wedges,

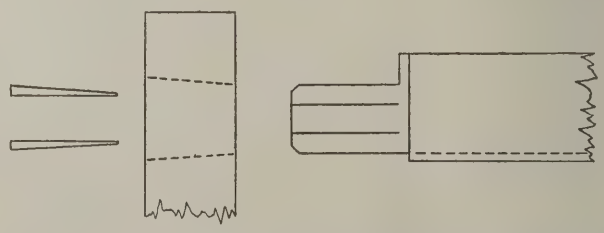


FIG. 2—SHOWING HOW TO PROVIDE "WEDGE ROOM" AFTER CUTTING THE MORTISE AND DRIVING OUT THE CORE

as shown in Fig. 1 of the sketches which I am sending herewith; also to run the rip saw through the tenon in two places, as clearly indicated.

After cutting the mortise and driving out the core, a chip or two would be taken off the ends for

wedge room, as shown in Fig. 2 of my sketches. Then when the tenon was driven into the mortise the wedges were driven into the saw cuts in the tenon. By this means part of the wood of the tenon would be pressed into the wedge room cut out of the mortise, thus making the tenon wider and giving it a firm grip in the mortise as well as a tendency to keep the joint together.

GRAPHICAL ANALYSIS OF A CONCRETE RETAINING WALL

From J. K., Paris, Tex.—I am sending a sketch, Fig. 1, of a retaining wall taken from the Steelcrete Handbook, page 153, and drawn to a sketch of ¼ in. to a foot. I would like to have Ernest McCullough show how to obtain the center of gravity and the resultant of forces by the graphical method on the order shown in the handbook.

Note.—In reply to the above, Mr. McCullough furnishes the following explanation:

The particular method shown in the drawing referred to by the correspondent is not known to me. It bears a resemblance to the well-known method of Professors Rebhann and Hasëler, based on the theory of Coulomb, but there are a number of lines I do not understand and there is a refinement apparent about the method which is not warranted by the data given in a retaining wall problem. Furthermore, the point of application is against the actual concrete section as if that were the wall, whereas the earth resting on the rear slab is a part of the wall and the pressure is exerted against it. The majority of theories of the retaining wall are silent about the angle of application of thrust because it is not known. In the diagram in question the thrust is assumed to be parallel with the angle of repose of the material, which is absurd. If this were true there would be no greater pressure when there is a surcharge than when the filling back of the wall is level, which we know is not true.

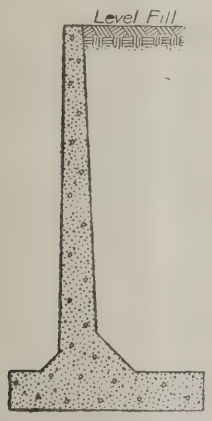


Fig. 1—Sketch Submitted by "J. K."

There being so much uncertainty about the real pressure against the back of a retaining wall, the angle of application and the point of application, it is usually safest when designing a reinforced concrete wall to consider the pressure as applied horizontally. Assuming the pressure of earth to act as a fluid, the point of application is accepted as being one-third the height from the bottom. Not many experiments have been made to prove this, but such as have been made apparently show that for a very low wall the pressure acts nearly half-way up. For walls 5 to 10 ft. high the pressure seems to act about four-tenths of the height above the bottom. For walls over 10 ft. high it is safe to assume the point of application of the pressure as one-third the height above the bottom.

About the time of our Revolutionary War, Coulomb announced his theory of the "wedge of maximum pressure" to explain the action of earth or any filling against the back of a retaining wall. Referring to the diagram the line *A C* forms an angle x with the horizontal, this being the angle of repose of the material. If the wall is removed the earth will break off and slide along a "plane of rupture" represented by the line *A G*. This wedge *A B G* represents the "wedge of maximum pressure." Rankine about the year 1858 brought out his theory of "conjugate pressures," but as the theory of Coulomb is the more simple, and when the pressure is assumed to act horizontally, gives practically the same results as those given by Rankine, it is in very common use. Rebhann's construction simplifies the finding of the point *G* at the upper edge of the plane of rupture. Briefly the construction is as follows:

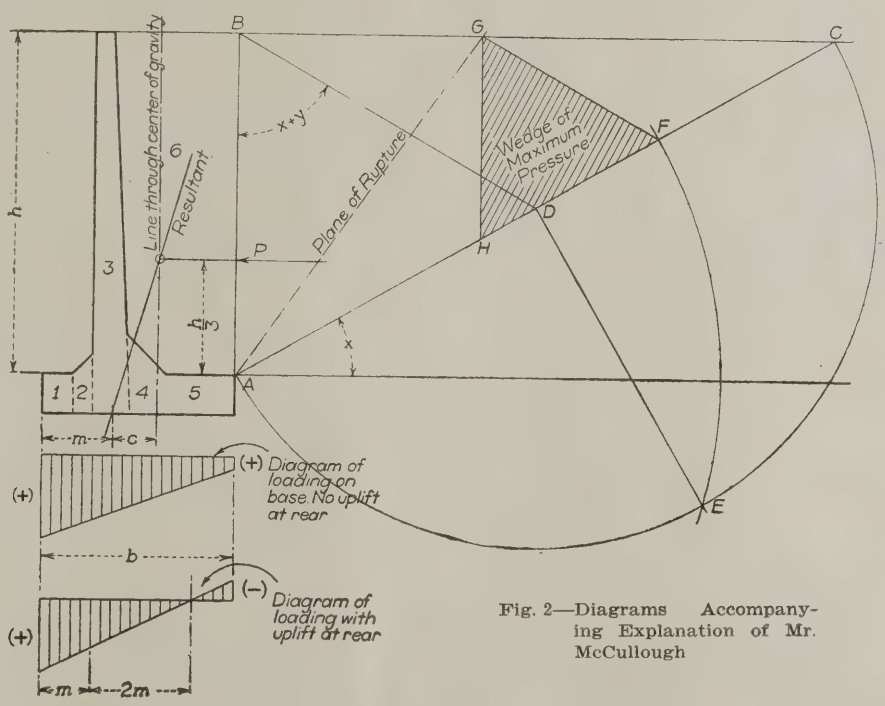


Fig. 2—Diagrams Accompanying Explanation of Mr. McCullough

The line *A C* intersects the surface slope at *C*. Bisect the line *A C* and draw on it a semi-circle *A E C*. Draw the line *B D* at an angle equal to

twice the angle of repose if the back of the wall is vertical, or $x + y$ if the back of the wall is sloped or battered. At the point D erect a perpendicular to the line $A\ C$ to intersect the semi-circle at E. Set the point of a pair of compasses at A, and with the pencil point at E draw an arc E F intersecting $A\ C$ at F. From F draw the line $F\ G$ parallel to the line $B\ D$, intersecting the surface slope at G. From the point F with a radius $= F\ G$ describe an arc intersecting the line $A\ C$ at the point H. The triangle $F\ G\ H$ has an area equal to the wedge of maximum pressure. The area of the triangle $F\ G\ H$ multiplied by the weight of a cubic foot of the material gives the horizontal pressure against the back of the wall. The pressure, shown by the line marked P is applied at the proper point and the line is extended to go through the vertical line through the center of gravity of the wall. The angle y is the angle between the angle of repose and a line perpendicular to the back of the wall, so the construction applies to walls having backs sloping away from or toward the fill.

The resultant of the weight of the wall, with the earth fill on the rear projecting slab, and the horizontal pressure should pass through the middle third of the base to insure stability. This is done actually to insure that the maximum earth loading shall not be greater than twice the average and that there shall be no tension, that is uplift, at the rear end. The resultant can pass outside the middle third under some conditions and still the wall may be stable. The middle-third theory, however, should be followed whenever possible. Referring to the figure, let W = the weight of the concrete wall and earth on back slab, the other letters being shown in the figure.

Then the maximum and minimum earth loading will be:

$$\textit{Maximum loading} = \frac{2W}{b}\ (2 - 3m)$$

$$\textit{Minimum loading} = \frac{2W}{b}\ (3m - 1)$$

based on the resultant passing through the middle third.

Assuming always that the portion of the wall under consideration has a length of 1 ft., the weight considered is that of 1 ft. of wall, of filling, etc. The following formula is also used to obtain the maximum and minimum loading at the front and back edges of walls:

$$\textit{Earth loading} = \frac{W}{b^2}\ b \pm 6c$$

in which the $+ 6c$ gives the maximum and the $- 6c$ gives the minimum loading. When the resultant passes outside the middle third the

$$\textit{Loading} = \frac{2\,W}{3\,m}$$

this value being the maximum loading at the front toe. The diagram of loading is a triangle with a base having a length equal to $3m$. This gives an area of tension above the horizontal as shown in the lower triangle of loadings.

The center of gravity of the wall is found graphically or by the method of moments. The graphical method is given on the drawing mentioned by your correspondent, but the method of moments is quicker. Figures are shown on the wall, which is divided into areas by dotted lines. Each area of concrete section is found and multiplied by 150 lb. to get the weight of the concrete, and the area of earth on the rear slab is multiplied by 100 lb., this being the assumed weight of 1 cu. ft. of earth. The center of area is found for each small area by drawing lines connecting opposite corners, the intersection being the center of area (gravity). The horizontal distance from the front edge of the toe of the wall to the center of gravity of each small area is multiplied by the weight of this area. The results are added together and the sum divided by the sum of all the weights. The result is the distance of the center of gravity from the front edge of the toe. Measure this off and draw the vertical line as shown. The distance c of the resultant from the center of gravity may be found as follows:

$$c = \frac{P \times \frac{h}{3}}{W}$$

An expression which may be used to increase the projection of the front toe if the base is found to be too narrow.

PLACING EXTERIOR SHEATHING BOARDS

From Young Woodbutcher, Greenville, R. I.—There has been much talk among the carpenters and builders in this section of the country as to which is the better way of putting sheathing boards on the exterior frame of houses—horizontally or diagonally. Some claim that if put on diagonally the boards tend to brace the building much better than when they are placed horizontally, while other mechanics advocate the horizontal method. It seems to me this would be a good subject for the trade to discuss, as it is more than probable that builders make use of both methods, depending upon the part of the country in which they are doing work. Personally, I would like to know why builders in one section use one method of putting on sheathing boards and in another section a different plan is followed. We all want to live and learn and I hope my brother chips will feel disposed to ventilate their views on this particular subject.

GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION

From C. J. M., St. Johns, Newfoundland.—The letter of "C. G. P.," Newark, N. J., in the November issue of the paper presents a very interesting

problem; one with which I fancy the every-day mechanic is not often confronted, and only those having a good practical knowledge of curved framing is capable of properly solving. Having had as a draftsman some experience in this kind of work, I will endeavor for the benefit of "C. G. P." to give the proper lines for doing the required work in such a way as to be easily understood.

It is required to obtain the curve by the intersecting rib between two curved roofs of very different profile. Referring to the accompanying diagrams, let *A-F* of Fig. 1 be the curve of the main roof corresponding to the house of the sketch submitted by "C. G. P." and *A-B-C* the intersecting roof of house *Y*. Divide the rib *A-B* into any number of equal parts, as 1, 2, 3, 4, etc., and from these points parallel to *A-G-C* draw lines to meet the line *A-H* produced. With *A* as a center, draw the connecting arcs to meet the line *A-G-C* produced and with lines parallel to *A-H* connect these points with the curve *A-F* in 1′, 2′, 3′, 4′, etc. At right angles to *A-H* and *A-G* respectively draw the lines *F-E* and *B-E* to meet *E*. Draw *E-C*, then *E-C* is the level seat line of the intersecting rib. Next parallel to *A-C* draw the lines 1′-*a*′, 2′-*b*′, 3′-*c*′, etc., to meet the line *E-C*, and from these points at right angles to *E-C* draw indefinitely the lines *a*′-1″, *b*′-2″, *c*′-3″, etc.

From the points 1, 2, 3, 4, etc., in the curve *A-B* parallel to *B-G*, draw the lines 1-*a*, 2-*b*, 3-*c*, etc., producting them to meet the lines 1′-*a*′, 2′-*b*′, 3′-*c*′ respectively and through the points thus obtained draw the double curve line *A-E*. This then will be the seat curve of the intersecting rib.

In order to obtain the profile or vertical curve of the intersecting rib make *E-D* equal to *G-B;* also 12″-*l*′ equal to 12-*l*, also 11″-*k*′ equal to 11-*k*, etc., and through these points draw the curved line *C-D*, which is the profile of the ribs and the mold by which to work out its vertical curve.

To make a mold to apply to the straight timber by which to mark the horizontal curve proceed as follows: Let the curved lines *A-B* and *A′-B′* of Fig. 2 represent respectively the horizontal and vertical curves of the rib. Draw the straight lines *A-B* and *A′-B′*. Parallel to these and at a convenient distance draw the lines *C-D* and *C′-D′*. Divide *C-D* into a number of equal parts and at right angles to *C-D* draw the parallels *C-a*, 1-*b*, 2-*c*, 3-*d*, etc., to meet the curved line *A-B*. Divide *C′-D′* into the same number of equal parts as *C-D*. Now make *C′-a′*, 1′-*b*′, 2′-*c*′, 3′-*d*′, etc., equal to *C-a*, 1-*b*, 2-*c*, 3-*d*, etc., respectively, then a line drawn through the points thus obtained will be the required curve of the mold to be applied to the straight timber to mark the horizontal curve of the rib. Of course, this is the center line and half the width of the rib must be laid off on each side of this line in order to make a mold.

If a flexible mold can be obtained—one that could be applied to the rib after it is sawn to the vertical curve—a slightly different mode of procedure is required to obtain this curve; then instead of drawing the line *C′-D′* and dividing it into equal parts, the curve *A′-B′* itself is divided and the mold laid out on a straight line or stretch out. The remainder of the process will be as just described.

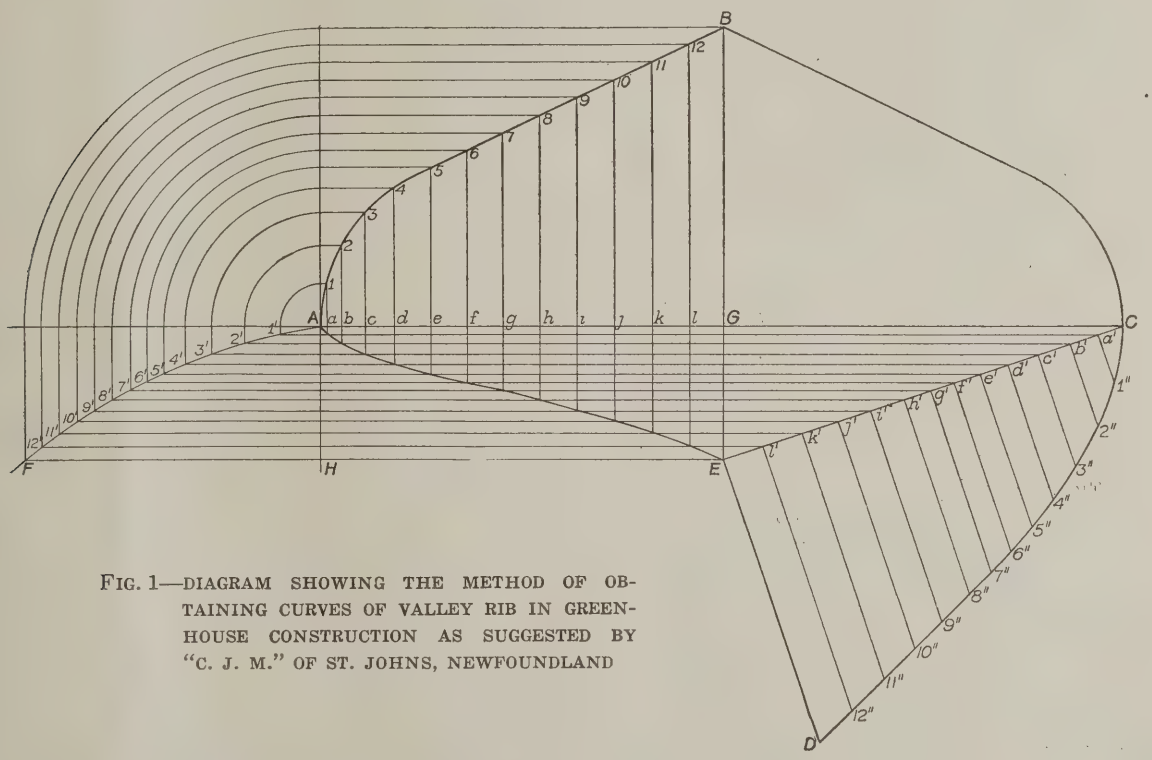


FIG. 1—DIAGRAM SHOWING THE METHOD OF OBTAINING CURVES OF VALLEY RIB IN GREENHOUSE CONSTRUCTION AS SUGGESTED BY "C. J. M." OF ST. JOHNS, NEWFOUNDLAND

WATERPROOF WALLS AND FLOOR FOR SHOWER BATH

From W. A. W., West Liberty, Iowa.—I have a customer who wants me to install a shower bath on

the second floor of a building, the room being 4 x 9 ft. in size, and I desire to learn from readers who may have had experience in work of this kind if such a job is practical. Could the walls and floor be plastered with something that is absolutely waterproof? If so, what is it and how could it be mixed and applied? It should be borne in mind that any moisture going through the material would soon rot the yellow pine lumber floor that we are obliged to use nowadays. I do not care to consider tin or galvanized iron as the shower bath is to be installed in a Fraternity House and will be used by thirty young men, so something good is absolutely essential.

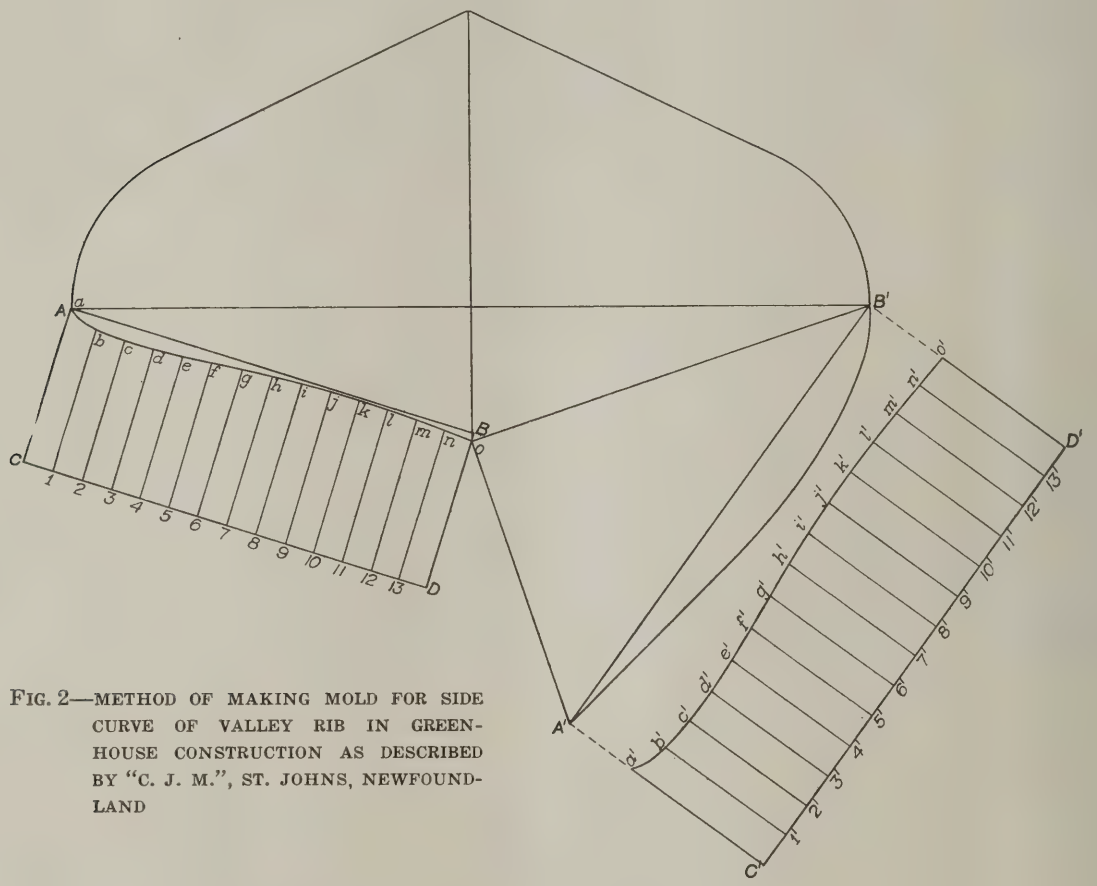


FIG. 2—METHOD OF MAKING MOLD FOR SIDE CURVE OF VALLEY RIB IN GREENHOUSE CONSTRUCTION AS DESCRIBED BY "C. J. M.", ST. JOHNS, NEWFOUNDLAND

WHERE HE FOUND THE BUILDING AGE

From F. M. V., Homestead, Fla.—In getting into the driving seat of my car a day or two ago I found on the floor a copy of THE BUILDING AGE, left there, no doubt, by some mechanic in the garage where I had put up for a slight repair. It was the August issue of the paper and I took it home and read it with a great deal of interest, more particularly as I am thinking of building another house soon. I had thought of putting up an Aladdin structure, modified, but I doubt after all if any house would satisfy me unless I had my "finger in the pie" of the construction. As a consequence, I am asking you to please send me the issues of the paper since August and at the same time tell me the price of subscription.

CUTTING BASE BOARDS AGAINST DOOR CASINGS

From G. H. C., Dallas, Ore.—I have been a reader of THE BUILDING AGE for something like ten years and have obtained much practical information from the Correspondence Department. I am in need of still further help and therefore would like to have some of the readers describe their method of cutting base boards against door casings. I do not remember of ever seeing an article on this phase of base board fitting which while simple in theory is not particularly so in practice, more especially if joints are to be taken as reliable evidence.

WHAT A VETERAN READER SAYS OF "THE BUILDING AGE"

From George S. Brown, Architect, Contractor and Builder, La Fayette, Ind.—I am now eighty years of age, having been in the building business for fifty years, and desire to inform my friends that I have closed my office and decided to retire. I wish to say that THE BUILDING AGE is a first-class magazine for the young men in the building business, as it contains details which other papers

do not, and all presented in a way to be of special value.

MITERING RAKE AND LEVEL MOLDINGS

From G. L. McMurphy, Tacoma, Wash.—I notice that "W. M. L." asks in the October issue how to make the cut to miter a raking molding to a horizontal or level molding? There are two methods of making a miter box that will cut the raking molding, the level molding being, of course, cut to the regular miter, the same as it would be if it was to continue around a square corner on the level.

In Fig. 1, mark the lines *a, b* and *d, c* on the side of the box the same as the pitch of the rake. In the example I have used a quarter pitch for both methods, and in this case use 6 on the tongue of the square and 12 on the blade and mark by the tongue. For the cross bevel across the top of the box take 12 on the tongue and the diagonal of 6 and 12 on the blade and mark by the blade. This

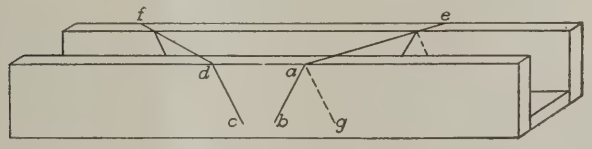


Fig. 1—One Method of Making a Miter Box to Cut the Raking Molding

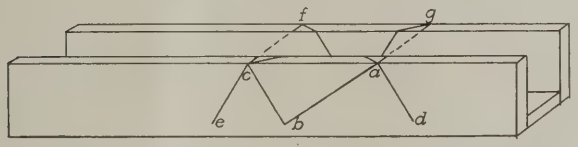


Fig. 2—A Second Method of Making the Miter Box

will give the cut desired, and it will be seen that it is the same as the cut for cripple rafters against the valley rafter.

The second method is the same in principle, but the result is arrived at by a slightly different road. In Fig. 2, mark the line *a, d* on the side of the box the same as before, using 6 on the tongue and 12 on the blade of the square and marking by the tongue. Then draw *a, b*, square with *a, d*, making it 12 in. long, and from *b* draw *b, c* square with *a, b*. From *a* and *c* square across the top of the box to *g* and *f*, and the cuts *f, a, d* and *g, c, e* will be the cuts desired. The molding must be placed in the box right side up, the same as it will go on the building, with the plumb side of the molding against the side of the box. If a spring molding is used and it is desired to cut it bottom side up, as we usually cut such moldings, then the lines on the side of the box must be reversed as the dotted line *a, g*, Fig. 1. The necessity for this will be readily understood when it is remembered that the top edge of a raking molding is the shortest when cut to miter with a level one.

Of course, it is understood that a different molding must be used on the rake than is used on the level.

The method of finding the shape of a raking molding that will "member" with a level one is "another story," as Kipling would say, but where there are stocks of molding of any considerable variety kept, it will usually be possible to find sizes that will work fairly well, but if that cannot be done it may be necessary sometimes to have a special molding run for the purpose.

To find the shape of a raking molding that will "member" with any given level molding, draw the level molding in the position it will occupy on the building, as *A B C D E G*, Fig. 3. Divide the face of the molding into any number of parts, as *a b c d e f C D*, and from these points draw to the vertical line of the molding, as *A M*, lines at right angles to that vertical line, as *a F, b g, c h, d i, etc.* Then through the points *A F g h i j*, etc., draw the lines *A K, F I, g b', h c', i d'*, etc., with the same pitch as the rake. Draw *L Y* at right angles to these lines. Make *L K* equal to *A B, R I*

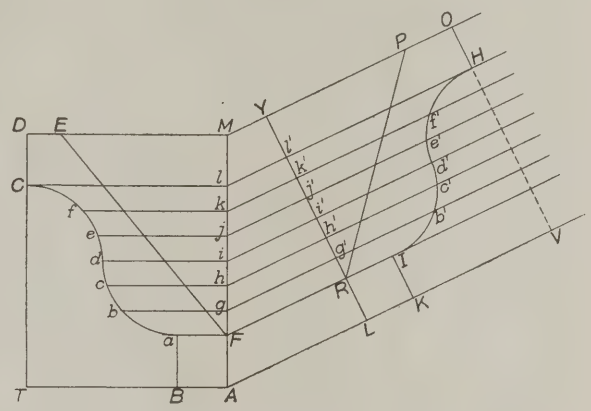


Fig. 3—Diagram Showing Method of Finding Shape of Raking Molding to Member with Any Given Level Molding

equal to *F a, g' b'* equal to *g b, h' c'* equal to *h c*, etc. Then through the points *K I b' c' d' e' f' H O* draw the line *K I H O*, which will be the shape of the molding desired. Why this gives the molding desired will be understood when it is seen that a rectangular piece of wood, of which *L Y O V* is the cross-section, will, when cut to the pitch of the rake shown, "member" with a level piece of which *A M D T* is the cross-section, and, of course, the molding cut from the two pieces will also "member" in the same way.

WHY BRICKS CRACK

Many bricks crack at the ends or on the face and about ¼ to ⅜ in. from the upper panel when made by the stiff-plastic or semi-plastic process, particularly if they are re-pressed, says a writer in an exchange. This is often due to the panel or bottom of the press striking the brick and forcing the sides of the clot upwards. Air and oil enter the cracks then formed and cause them to widen.

Some brickmakers consider the fault is in the rounded face of the clot, but a more frequent cause is the indent plates which are cast into the plunger or bottom plates instead of being made separately and accurately machined before being fitted.

PROVIDING VENTILATION FOR GARAGES

A SOURCE OF DANGER—FLEXIBLE TUBING SLIPPED OVER MUFFLER CARRIES GASES OUTSIDE

SINCE the use of the gasoline automobile has become widespread there has arisen a definite need for ventilation requirements in garages, motor-car repair shops, and, in fact, all enclosed spaces in which gasoline motors are operated. With a view to throwing light upon the ventilation of garages, C. W. Obert, secretary of the American Society of Heating and Ventilating Engineers, presented an interesting paper at the semi-annual meeting of the society, recently held in Detroit. He stated, among other things, that "for reason of the invisibility of the exhaust gases from these motors, it has been customary to operate them indiscriminately, whereas it is interesting to note that in no case would any other form of combustion device, such as stove or forge, be operated indoors without a chimney connection. In a number of instances deaths have occurred as a direct result of confinement in limited spaces where the air has become contaminated by the exhaust gases from such motors, and in many other cases great discomfort has arisen from such continuous operation in larger spaces having inadequate facilities for ventilation.

"While it is true that the cases in which deaths have occurred have been largely those where motor vehicles have been operated in small garage buildings with the doors entirely closed, generally in cold weather, still the result is indicative of the danger that is present. Usually, in such cases, the motors have been operated with their carbureters poorly adjusted, so as to give improper mixtures, or chemicals have been injected into the cylinders perhaps for the removal of carbon, and the result has been the formation of carbon-monoxide or some other deadly gas in sufficient quantity to cause the death of the operator from asphyxiation or gas poisoning. These occurrences have been sufficiently frequent during the past winter season for a number of health boards in various cities to have given serious consideration to an investigation of the entire problem of garage ventilation.

DANGER FROM GASES

"It may be well to point out the fact that one of the particular dangers of these deadly gases is the fact that they have practically no distinguishing odor or manifestation to warn those who may be affected against their presence. Such gases may develop from improper carbureter adjustment or from faulty ignition in the motor, and may increase to a sufficient extent, if the doors are closed, to become dangerous to persons breathing that atmosphere before they become aware of any contamination. In the many cases of deaths in small garages reported during the past winter, the victim apparently made no effort to get out into the open air, but merely dropped where he stood, due to the quick effect of gas poisoning; he was apparently overcome so quickly as to be powerless to help himself or call for help. Herein lies the wisdom of the health boards issuing a warning to all occupants of small garages against this danger, with preferably the suggestion of possible means of prevention of the trouble.

PREVENTION OF THE TROUBLE

"While means for prevention of this trouble are the simplest in the small private garages, this type of building is, however, that in which such ventilation is most needed. Accordingly, some of the arrangements worked out for such cases that have come to the writer's attention will be referred to. That most generally used is the rubber hose or flexible metal tubing, with one end slipped over the outlet of the muffler pipe of the motor car and the other end passed through the side of the building to the outer atmosphere. This arrangement works out entirely satisfactorily provided the hose or tubing fits closely on the muffler outlet. If, however, the hose or flexible tubing is larger than the muffler outlet, the effectiveness of the arrangement is impaired, as in case of a strong wind pressure on the side of the building through which the hose or tubing outlet passes there is danger of a strong counter current back into the interior of the garage.

"There is also, with this arrangement, the possibility of damage to the motor car if it should be backed out of the garage before removal of this connection. This will be evident when it is considered that in most cases motor cars are run front-on into such garages, and are then necessarily backed out when leaving. If the trouble be taken to back the car in, this difficulty would not arise, as when it is run out the hose or tubing, if left on, would automatically pull off the muffler outlet.

"The more desirable arrangement is to have such hose or flexible metal tubing pass out through the roof or upper portion of the building, suspended from the ceiling to the point of muffler connection, where it would be not only convenient to apply, but also be easy of access, easily seen, and free from possible damage as a result of lying on the floor. If the car is liable to be run into the garage either head foremost, or backed in, it is well to provide an outlet connection at either end of the car space; or, better yet, to provide one only at the rear, with the stipulation that the motor shall not be run for testing purposes unless the car be backed into the garage, where the muffler connection can be easily made."

MEETING OF OHIO BUILDERS EXCHANGES

AN ENTHUSIASTIC GATHERING AT TOLEDO—IMPORTANT MATTERS DISCUSSED — OFFICERS ELECTED

AFTER a successful career of fifteen years the Ohio State Association of Builders Exchanges met in annual session in the rooms of the Builders Exchange in Toledo, Ohio, on Tuesday, Wednesday and Thursday, Dec. 12, 13 and 14. The attendance at the convention was representative of the building industry of Ohio, nearly all of the thirteen cities affiliated in the association sending good-sized delegations. The banner in this regard went to the Akron Exchange, whose party numbered twenty-five, the journey being made to the convention city in a private car. Matters of great importance to the building interests of the Buckeye State were considered and acted upon at the convention, which was enthusiastic from the very start to the finish.

The large assembly room of the Toledo Exchange, located in the Smith & Baker Building, in the heart of the business section of the city, was tastefully decorated with American flags, potted plants and flowers when the convention opened at two o'clock on the day named. A reception committee comprising prominent members of the Exchange greeted the visitors as they arrived and extended the hospitality of the rooms, together with tickets and badges covering the entertainment features provided for the convention. A matter of regret at the opening session was the inability of President C. Taylor Handman of the association to be in attendance on account of a recent bereavement in his family, and the chair was occupied by L. E. Fishack, first vice-president. Upward of one hundred men were in attendance at this session. The cities now comprising the Ohio State Association are Alliance, Akron, Canton, Cleveland, Columbus, Cincinnati, Dayton, Elyria, Lima, Newark, Springfield, Toledo and Youngstown.



President L. E. Fishack of Toledo

ADDRESS OF WELCOME

Before entering upon the consideration of business, the convention arose to hear the invocation pronounced by the Rev. Ernest D. Allen, pastor of the Washington Street Congregational Church. The address of welcome on behalf of the city of Toledo was delivered by Charles T. Lawton, Director of Law, who made a characteristic speech in which he turned the city over to the visitors for their stay.

THE SECRETARY'S REPORT

The report of the secretary-treasurer was presented by E. A. Roberts, indicating the work accomplished by the organization since the last general meeting, this report being in part as follows:

Since the last convention of our association the duties of your secretary have been largely given to correspondence on matters relating to the welfare of the various exchanges within our affiliation and to matters of a general character, rather than to any special legislative work, inasmuch as no session of the General Assembly was held last winter. As you are aware, the enactment of a State Building Code was deferred as a result of action of our association and the aid of other interests in the State opposed to the code in the form in which it was presented at the last session of the legislature. The code will probably be up for consideration at the coming session and should have the careful consideration of all of the affiliated bodies represented in our organization, as well as by a committee representing the association as a whole.

The resolution adopted at our last convention recommending that building operations be started as a means of giving employment to workmen was endorsed by Governor Willis, who issued a proclamation along the same lines soon after the meeting. There is no doubt that this movement in which all of the exchanges co-operated by having articles published in their local newspapers, and otherwise bringing the matter to the attention of the public, did much good in the encouragement of building operations at a time of temporary depression. While the same causes do not exist at the present time the secretary believes that reasons exist now for encouraging the public to build as much as possible during the winter season owing to the probable rush of the coming season and the increasing scarcity of skilled labor and certain lines of materials.

Since the last session, the architects of the state have formed an organization similar to ours with five chapters at present enrolled for work along lines of benefit to the profession. These chapters are located in Cincinnati, Columbus, Dayton, Toledo and Cleveland and the officers of the association are: President, Gustav W. Drach, of Cincinnati; vice-president, Lawrence S. Belman, of Toledo, and secretary-treasurer, Herbert Briggs, of Cleveland. Our members will recall that Mr. Briggs made a special study of building legislation as a member of the last General Assembly, and

was a speaker at our convention in Columbus. The officers of the association are favorably disposed toward co-operation with our state organization, and it has been suggested that a conference committee be established for the consideration of legislation and other matters of mutual interest. I would recommend that action be taken at this meeting authorizing the president to appoint such a committee so that it may be in readiness to take up any matters that may arise in connection with the coming session of the assembly.

ADDITIONAL EXCHANGES NEEDED

Our state association now includes thirteen exchanges representing nearly all the principal cities of the State. The exchange in Akron has been revived with a large membership and is well represented at this convention. While Ohio has the largest number of affiliated bodies of any State in the Union, there is still room for other exchanges, and we hope to see them organized in the near future. It is certain that every community of any size should have an association of builders not only for the benefit derived by the individual members but for the good such an organization can be to the public at large. The officers of the association are ready at all times to co-operate with any committee that may be established in these cities, and wishes to assist in all possible ways in the formation of such bodies. The modern stress under which all lines of business are conducted is an impelling argument for the improvement of conditions.

The prospects for the coming year are such that every builder should be earnest in his efforts to strengthen the organizations already existing and exert every possible influence along all legitimate lines. As the individual associations are thus made stronger, our State affiliation will naturally be stronger in the work that it has to do throughout the commonwealth.

Subjects which will undoubtedly call for action in the near future are the workmen's compensation, proposed changes in the lien law and probably other measures affecting the interests of our members either directly or indirectly.

REPORTS OF AFFILIATED EXCHANGES

Upward of an hour was then devoted to the hearing of reports from the various affiliated bodies relative to their condition and the state of building operations in the different cities.

For Cleveland James R. Gloyd reported the Exchange to be in an unusually prosperous condition, recently entering new quarters, comprising over 15,000 sq. ft. of floor space in the Rose Building, one of the largest and best equipped office buildings in the city. He stated that the limit of membership of 400 had been removed and the Exchange had added a considerable number above this former limit. He told of the organization of the Building Trades Employers Association as an adjunct to the Exchange to have general charge of labor matters.

For Columbus R. L. Watson, president of that Exchange, said that the membership had reached 265 and that the general condition of the organization was very satisfactory. He also reported the organization of a sub-association to consider labor matters.

For Akron a report was made by Scott Porter, secretary of the Exchange in that city, indicating a membership of 180, which was considered a 95 per cent organization in certain lines. Mr. Porter stated that Akron was enjoying an unusual period of prosperity owing to the activities of the rubber industry, the building permits for eleven months of this year having reached $12,500,000 in comparison with $6,500,000 for the entire year of 1915. The Akron delegates surprised the convention by giving a college yell at the conclusion of this report, this yell being adapted to their city and Exchange.

For Dayton T. P. Kearns, former Chief Inspector of Workshops and Factories for Ohio, and now acting as secretary of the Exchange, reported a membership of 120, which is largely representative of the building interests of that city. He said that the last year had been a successful one for the building industry and that the outlook was promising for 1917.

The Canton Exchange was represented by W. T. Kirk, its secretary, who stated that the membership in that city is now 150 and that the Exchange is considering the erection of a building to cost in the neighborhood of $150,000 to accommodate architects, builders and material dealers as well as the offices of the organization. He told of the establishing of an employment bureau which has placed an average of 300 men per week during the season. Mr. Kirk stated that it was practically impossible to obtain houses for rent in Canton owing to the prosperity of the various industries.

For Springfield it was reported by R. A. Brown that the Exchange membership comprises 102 dealers and builders and that a feature of the year was the co-operation given by the Exchange to establishing a fund for bringing industries to that city. A new building code is being prepared for Springfield with the help of the Springfield Exchange.

Other reports from the cities represented at the convention were along similar lines, all indicating active organizations engaged in work for the building interests in their communities and hopeful of good conditions the coming year, barring the scarcity of labor and indications of possible troubles in securing materials.

MECHANICS' LIEN LAW

An address on "Results from the Operation of the Mechanics' Lien Law" was made by Hon. Warren J. Duffy, author of the present law. Mr. Duffy admitted that the law had some defects, as shown by its practical operation, and he favored a correction of these defects at the next session of the General Assembly. One of these defects was, in his opinion, the need for broadening the law so as to cover the issue of liens on public work the same as is now permitted on private work. Mr. Duffy strongly urged contractors to keep each contract separate in their bookkeeping, thus enabling them to comply with the requirements of the law to a much better extent than if no such records were maintained, and avoiding hardships which otherwise might be entailed. While there were some who were not satisfied with the provisions of the Ohio law, Mr. Duffy declared that it was as near compliance with fair

and equitable conditions as any law passed by the legislatures of any State of the Union and that he believed it would receive general approval when the results of experiences had been applied to its improvement.

Following the address there was a lively discussion in which various delegates joined and many questions were asked concerning features of the law, which were explained in detail by Mr. Duffy.

THE SMOKER

In the evening a smoker was held in the Exchange rooms, which was largely devoted to sociability. The only formal feature on the program was an illustrative talk by Prof. R. B. Plumb, managing director of the Trus-Con Laboratories of Detroit on "Waterproofing and the Preservation of Building Materials." Refreshments were served at the close of the evening and there was a period of hand-shaking and good-fellowship.

WEDNESDAY'S SESSION

At the opening of the session on Wednesday a review of State building code legislation was made by T. P. Kearns, who in his capacity as Inspector of Workshops and Factories was a member of the commission having the drafting of this code in hand. Other members of the commission were the State Fire Marshal and the secretary of the State Board of Health. This commission had as an advisor Fred W. Elliott, a well-known Columbus architect. Portions of the code already enacted are those relating to theaters, assembly houses, schools, sanitation and standard devices. It is proposed at the coming session of the legislature to complete the code so as to cover all buildings excepting dwellings. Mr. Kirk advocated that some corrections be made in the document as a result of its operation, stating that when this should be done he believed Ohio would have as fair building regulations as any State in the Union.

WORKMEN'S COMPENSATION LAW

An address on the workmen's compensation law was delivered by H. O. Dunbar, representing the Aetna Insurance Company, who stated that a movement was undoubtedly contemplated by the next state administration to limit the writing of compensation hereafter in Ohio to the State Industrial Commission, thus preventing private companies from doing business in this line in the State. At present there are three methods under which employers may obtain this protection; namely, to insure under the State fund or with a mutual company or to carry the liability themselves with the approval of the State commission, having the risk underwritten, if desired, by a private insurance company. Mr. Dunbar characterized the plan of the State to limit the writing of this insurance to the industrial commission as a monopoly and doubted the wisdom of such action.

A joint trip of all of the Ohio Exchanges to Atlanta for the national convention to be held in that city in February was advocated by R. L. Watson, who presented a report on transportation arrangements and other essentials of such a trip for the consideration of the affiliated bodies. It is probable that some action will be taken in favor of such a plan.

RESOLUTIONS ADOPTED

Several resolutions were adopted at the convention. One of these recommended to the State authorities that in the enactment of the State building code the same be made as general as possible in its requirements, rather than be detailed and specification-like in character, leaving to the individual cities a large measure of home rule in the matter of building regulations.

Another resolution recommended that the lien law be amended along the lines indicated in Mr. Duffy's address so as to make the same more fair and equable for contractors and others interested in public work.

A resolution of thanks to the Toledo Exchange for the splendid entertainment provided for the convention was also adopted by unanimous vote.

Action was taken by the convention providing for the appointing of a committee on conference with a similar committee representing the Ohio State Association of Architects; this joint committee to have authority to represent the two organizations on matters of legislation and other subjects of mutual interest.

OFFICERS ELECTED

Officers for the ensuing year were elected by acclamation as follows:

President.....L. E. Fishack of Toledo
1*st Vice-Pres*..R. A. Brown of Springfield
2*nd Vice-Pres*..R. L. Watson of Columbus
3*rd Vice-Pres*.....Scott Porter of Akron
Sec.-Treas.....E. A. Roberts of Cleveland
Assist. Sec..Clarence Metters of Columbus

The election of an assistant secretary was deemed advisable in order that the association might have a representative at the State capital with whom communication can be readily had during the session of the legislature, and at other times when information is desired.

The time and place of the next convention were left to the officers and executive committee to decide, although the preference of the convention seemed to be for holding the 1917 meeting in Akron.

Greetings were extended to the delegates by H. B. McGrath of Cleveland, president of the Ohio Hardware Dealers Association, who strongly urged the strengthening of organizations of business men in all lines to cope with the unusual conditions now existing in the business world. The business of the convention was concluded at noon and the afternoon was devoted to a visit to the Ohio and Michigan Land Products Exposition in progress in the Toledo auditorium, where the

visitors were very much interested in the displays and exhibits.

THE BANQUET

In the evening a banquet was held at the Toledo Commerce Club, where about 150 persons were present. After an enjoyable dinner, during which music was furnished by an orchestra, Mr. Fishack called the assembly to order and acted as toastmaster. The first speech was made by Otto Hohle, a representative of Toledo, who made a highly interesting and pleasing address on "Relation of Architect to the Contractor." The speaker commented on the changing methods in all lines of business and especially that of building, and emphasized the necessity of business men estimating very carefully the cost of performing work if they are to protect themselves against financial loss. He made some sport of what he termed "bogus architects and bogus contractors," saying that in his opinion efforts should be made to rid the profession of this class of operators. He advocated that both contractors and architects endeavor to standardize their business and favored a close relationship between architects and builders as beneficial, not only to each of these but to the owner as well. "A design is not worth much," he remarked, "unless it is well executed. An architect seldom is able to carry out his plans and great credit should be given the builder for the part he plays in executing any given building enterprise." Mr. Hohle caused a distinct feeling of enthusiasm to be manifested when he advocated that the architects and builders of Toledo plan to erect a building in which both branches of the business may be housed together with dealers and concerns associated in construction work.

A very attractive address was given by Hon. Holland M. Webster, former prosecuting attorney of Lucas County, and a prominent lawyer of Toledo, who entertained the crowd with a series of delightful stories and periods of unusual eloquence. Following his speech brief remarks were made by a large number of the visiting delegates, the evening closing with a speech by Secretary Albrecht of the Toledo Exchange, who expressed the satisfaction of the officers of that organization upon the success of the annual meeting.

An automobile ride for delegates who remained over until Thursday morning concluded the official program.

CONVENTION OF FRONTIER MASON BUILDERS' ASSOCIATION

The seventh annual convention of the Frontier Mason Builders' Association was held in the Gold Room of the Hotel Wisconsin, Milwaukee, Wis., on Dec. 12 to 14, inclusive. The delegates were called to order at 2 o'clock by President W. C. Kroening, at which time reports were presented from representatives showing the conditions existing relative to labor, material and amount of building executed in various cities.

The morning and afternoon sessions of Wednesday, as well as the morning session of Thursday, were occupied by a discussion of timely trade topics, among which mention may be made of "Uniform Agreements with Employees," "Affiliation of Bricklayers, Hoisting Engineers and Other Crafts," "Uniform Apprentice Laws," "Lien Laws," "Wages," and "Actual Cost of Mason Work and Overhead Expense."

The Milwaukee committee had intended an automobile trip on Thursday afternoon so as to enable the delegates to visit various points of interest, but the weather turned so suddenly unfavorable as to prevent.

Tuesday and Wednesday evenings the delegates were taken in charge by the Committee on Entertainment which had prepared a novel and interesting program. The convention terminated Thursday evening with a farewell dinner at Hotel Wisconsin, at which time the visitors and guests were royally entertained by Mr. Reese as toastmaster and the Adelphi Quartet.

The following officers were elected to serve during the ensuing year:

President.William F. Felton, Buffalo, N. Y.
1*st Vice-Pres*.Henry Hayman, London, Ont.
2*nd Vice-Pres*...S. J. Pickett, Toledo, Ohio
Secy.-Treas...L. A. Griffin, Cleveland, Ohio

As the organization has grown beyond its name, a resolution was adopted that it be known in the future as the Mason Contractors' Association of the United States and Canada.

It was decided to hold the next convention of the organization in the city of Indianapolis, Ind.

SAN FRANCISCO BUILDING CONDITIONS

Our correspondent in San Francisco, writing under date of Dec. 5, says: The expansion of industrial activity, which prevented a slump in the building trades earlier in the year, is having an even greater effect than before in the San Francisco Bay district. A substantial volume of work is still in progress on manufacturing plants of various kinds, some of which are built rather cheaply, and some of first-class construction. Among examples of the latter are some of the buildings being erected by the Union Iron Works, which recently let a contract for a three-story reinforced-concrete office building on its local property to cost about $160,000. The growing payrolls, however, have brought greater demands for business space in both downtown and suburban locations, and the demand for living accommodations is rapidly overtaking the present facilities. These factors are held responsible in large part for the increase in the November building record, which was the largest since last June, despite some unfavorable weather. The total is made up largely of buildings of medium size, contracts of real magnitude being the exception, though small work is on the increase. A notable feature of present development in San Francisco is the opening of new tracts of land suitable for types of dwellings not prominent here in the past.

Lumbermen are passing around the word to "build now" to those who contemplate erecting wooden buildings, as prices remain comparatively low in this market, but are expected to advance within the next few months. Car shortage is the governing factor in the lumber market, as the Eastern demand is unusually large. Orders booked by north Coast mills the last week of November were 30 per cent in excess of shipments, while lumber is piling up at the mills. This, of course, holds local prices down, but as soon as cars can be had the outside demand will easily take care of the present output. Export trade also would be heavy if ships could be had. There has been an unusually large movement of lumber to the California agricultural districts for the last month, the high prices of farm produce having resulted in a marked revival of rural building activity. A prominent feature of country building is the silo—the redwood stave and concrete types being most common. Ten years ago this form of building was little known in California, but it is now becoming quite common.

A new organization, known as the San Francisco Retail Lumber Yards, and including thirty local firms, is working to establish more stable and satisfactory business methods, and in particular to spare millmen and contractors the annoyance of dealing with unreliable curbstone brokers, who have formerly handled the distribution of lumber from Northern mills on a somewhat speculative basis.

Brick and terra cotta manufacturers report an active market for practically all their products, brick being used rather largely in the better class of residence work now in progress, as well as in business buildings. A good deal of brick and terra cotta have been shipped to islands in the Pacific.

The steel market is causing builders no little concern, as the cost of plain structural shapes is now $80 per ton, and structural plates are held at about $105 per ton. Bars for concrete work can still be had around $75 per ton, and are in quite active demand. Galvanized sheets are held at almost prohibitive prices, and are hard to get at that.

DEATH OF JOHN CAMPBELL

John J. Campbell, one of the foremost builders of Kingston, N. Y., died at his home in that city on Nov. 26. He was born in Kingston and his activities centered around it. On leaving the public schools Mr. Campbell learned the mason's trade and worked at it until 1884, when he formed a partnership with Patrick Dempsey under the firm name of Campbell & Dempsey, contractors. This partnership continued up to a few years ago, when Mr. Dempsey retired and Thomas J. Dempsey, a son, was taken into the company which was then incorporated under the name of Campbell & Dempsey Co., Inc.

Both the old and the new firms enjoyed great prestige and some of the best known buildings in Kingston and New York State were built by them.

New Publications

Gray's Plumbing Design and Installation. By William B. Gray. 560 pages, 6¼ x 9¾ in. Illustrated with 500 line engravings and 33 tables. Bound in heavy board covers. Published by the David Williams Company. Price $4.00.

While plumbing work is something with which the average builder has comparatively little to do, yet it is a phase of building construction with which he desires to be more or less informed, and the book under review is one worthy of a high place for constant reference. It is the expression of the life work of a man who passed through all stages from an old-time apprenticeship to an honorable mastery of the craftsmanship, principles and theories of all that plumbing means. It represents a wide study, searching observations and exhaustive experience of a man who was earnestly eager to give reliable assistance to those in the field in which he labored. It gives that information that has been lacking in American training of plumbers. It affords a solution of those problems which brought loss to those who could refer to nothing that would aid in mastering them. A new use is made of engineering data arranged to be readily applied to the questions which confront the practical plumber doing every class of work. Rather than a work to be read, it is a collection of information applicable to an infinite variety of questions that arise in practice. The matter is comprised in 94 chapters, and for convenience these are divided into five sections or parts. In each the preparation of the matter has been with a view to serving those whose educational opportunities have been scant. The beginner may take it as his textbook and a persistent study of it will serve the most of his needs. In order to facilitate reference an index covering 28 pages has been incorporated.

MEETING OF CEMENT MANUFACTURERS' ASSOCIATION

The annual meeting of the Portland Cement Association, with headquarters in Chicago, was held the second week in December at the Biltmore Hotel in New York City, during which numerous matters of trade interest were considered by the representatives in attendance. B. F. Affleck was re-elected president of the association and J. P. Beck continues as the general manager.

The Ceramic Engineering Building of the University of Illinois, recently dedicated at Urbana, Ill., is a three-story structure covering an area 67 x 189 ft., and is built of materials which are representative of the Ceramic arts, such, for example, as high grade brick, tile, terra cotta, cement and gypsum products.

The first fireplace with a regular chimney built in England is said to have been constructed in the Norman Castle of Carnarvon, Wales.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS FOR NOVEMBER SHOW 4.22 PER CENT INCREASE OVER NOVEMBER, 1915

NOTWITHSTANDING the unusual activity in building operations which had begun to manifest itself a year ago at this season, the reports from 121 cities covering the month of November, 1916, show a gain of 4.22 per cent as compared with that period. The striking feature is the tremendous increase in the Southern cities as contrasted with a falling off of nearly 10½ per cent in the Eastern cities. The latter is due to the shrinkage in operations in three of the boroughs of Greater New York and in many of those cities where a year ago extensive additions were being made to plants turning out munitions of war. The falling off in projected buildings in the Borough of Manhattan is undoubtedly due in large measure to the high cost of structural steel, as in November there were only three apartment houses planned, to cost $875,000, while in November last year 21 were planned, involving an outlay of $2,835,000.

CITIES OF EASTERN STATES

	November, 1916	November, 1915
Allentown	$151,435	$133,800
Altoona	20,945	35,547
Atlantic City	274,690	528,565
Bayonne	176,503	137,495
Binghamton	172,222	139,160
Boston	2,316,404	3,035,573
Bridgeport	495,171	490,973
Brockton	164 354	96,730
Buffalo	1,042,000	788,000
East Orange	144,815	89,018
Elizabeth	216,139	166,609
Erie	259,011	139,465
Harrisburg	132,885	84,375
Hartford	509,562	707,709
Haverhill	91,050	78 300
Hoboken	24,185	90,580
Holyoke	52,025	108,550
Lawrence	95,815	190,015
Manchester	110,391	111,898
Newark	1,280,127	641,385
New Bedford	315,150	165,119
New Britain	147,400	193,550
New Haven	461,655	966,080
New York:		
Manhattan	2,270,896	4,601,215
Bronx	1,028,900	3,355,038
Brooklyn	2,973,850	3,944,800
Queens	2,176,425	1,675,200
Richmond	263,788	242,522
Passaic	48,075	99,975
Paterson	90,335	149,585
Philadelphia	4,451,925	2,308,665
Pittsburgh	918,806	663,312
Quincy	78,490	146,594
Reading	85,700	21,025
Rochester	595,993	817,254
Schenectady	109,571	60,425
Scranton	199,924	240,164
Springfield	985,776	650,050
Syracuse	655,833	700,147
Trenton	102,293	157,595
Troy	50,545	70,735
Utica	196 300	151,035
Wilkes-Barre	100,076	48,535
Woonsocket, R. I.	42,350	94,020
Worcester	532,120	354,839

In the middle or central section of the country 37 cities reporting indicate a gain as compared with last year of 11.15 per cent. The notable increases are found in Detroit, Cleveland, St. Paul, Columbus, Indianapolis, and Milwaukee.

CITIES IN MIDDLE STATES

	November, 1916	November, 1915
Akron	$1,164,465	$1,215,045
Canton	255,175	138,250
Cedar Rapids	163,000	119,000
Chicago	10,056,100	10,861,600
Cincinnati	771,195	790,965
Cleveland	2,843,245	2,434,715
Columbus	554,965	347,350
Davenport	101,370	33,143
Des Moines	201,810	125,070

CITIES IN MIDDLE STATES—Continued

Detroit	5,707,235	3,482,680
Dubuque	22,210	18,600
Duluth	188,755	204,446
East St. Louis	71,345	206,010
Evansville	89,786	277,383
Fort Wayne	207,425	163,525
Grand Rapids	182,702	335 325
Indianapolis	721,076	438,823
Kansas City, Kan.	77,880	86,802
Kansas City, Mo.	916,250	724,115
Lincoln	102,265	186,705
Milwaukee	1,703,180	637,936
Minneapolis	944,890	1,539,225
Omaha	726,105	656,075
Peoria	131,390	197,575
Saginaw	22,400	33,119
St. Joseph	12,465	64,819
St. Louis	1,244,904	782,943
St. Paul	864,933	619,701
Sioux City	109,100	194,297
South Bend	70,929	77,300
Springfield, Ill.	83,615	160,745
Superior	64,595	46,975
Terre Haute	13,635	141,218
Toledo	543,270	535,755
Topeka	28,990	69,650
Wichita, Kan.	83,400	23,925
Youngstown	269,635	203,790

As already intimated, the feature of the general situation is the heavy increase in operations in the southern tier of states. Of 24 cities reporting, 19 show increased activities with a gain of 54.39 per cent.

CITIES IN SOUTHERN STATES

	November, 1916	November, 1915
Atlanta	$347,167	$284,647
Baltimore	936,480	690,478
Beaumont	90 000	41,272
Birmingham	204,309	148,733
Charlotte	57,782	30,200
Chattanooga	47,088	53,532
Dallas, Tex.	272,595	269,498
Fort Worth	117,590	124,243
Huntington	124,155	108,815
Jacksonville	75,180	106.225
Louisville	364,710	227,720
Memphis	271,400	191,485
Montgomery	31,385	11,695
Nashville	143,917	108,665
New Orleans	234,072	156,551
Norfolk, Va.	139,210	138,926
Oklahoma City	207,006	99,765
Richmond	477,158	275,251
San Antonio	298,351	127,340
Savannah	29,215	80,515
Tampa	97,101	100,335
Waco	66,780	13,035
Washington	1,531,864	594,925
Wilmington	171,631	120,020

In the extreme western section of the country 15 cities report an increase of 12.65 per cent, this showing being due largely to the situation in San Francisco, elsewhere referred to, where building operations in November were the largest since last June, notwithstanding some unfavorable weather.

CITIES IN EXTREME WESTERN STATES

	November, 1916	November, 1915
Berkeley, Cal.	$113,743	$173,075
Colorado Springs	140,331	13,590
Denver	324,000	312,085
Los Angeles	1,494,518	1,000,239
North Yakima, Wash.	25,410	16,600
Oakland	281,868	455,460
Pasadena	116,657	131,660
Portland	252,095	210,595
Pueblo	17,260	10,975
Sacramento	142,771	90,588
Salt Lake City	166,400	156,705
San Diego	114,992	99,232
Seattle	481,325	798,810
Stockton	75,902	34,185
Tacoma	284,687	75.465

For the 11 months of the year the estimated cost of new construction work indicates a gain of about 20 per cent as contrasted with last year.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

A New Reinforcing Plate for Concrete Work

A new ribbed reinforcing plate which is in effect a combined centering and reinforcement, especially adapted for use in reinforcing floors, roofs, sidewalls, partitions, stucco construction, suspended ceilings and

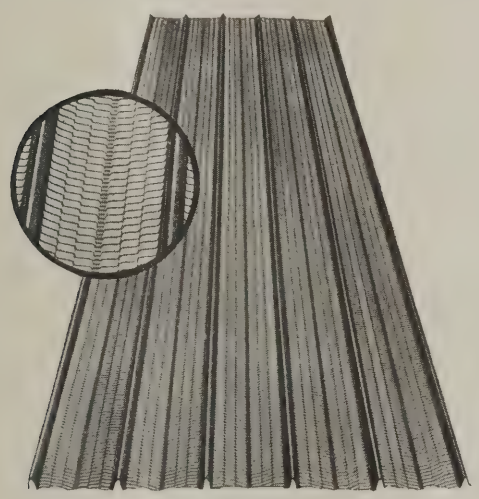


Fig. 1—New Reinforcing Plate for Concrete Work

in fact all kinds of construction work where concrete or plaster is used, has just been placed upon the market by the Berger Manufacturing Co., Canton, Ohio, and a general view of it is presented in Fig. 1. It is aptly named "Ribplex" and the design is a plexus of network of strands forming meshes between V-shaped stiffening or supporting ribs. These ribs have an inverted arch shaped formation at their base from which start the turned-on edge mesh strands. This combination is said to greatly increase the strength and rigidity of the plate, adding very materially to its utility and quality. The small meshes formed between the ribs prevent the soft concrete from running through and constitute a splendid bond with the concrete so that it is possible to develop the full tensile value of the metal. This, it is pointed out is a most desirable feature. The process of manufacture has been brought to a degree of perfection which is said to insure a perfectly uniform product. We understand that the Company will forward to architects and builders on application, samples of "Ribplex" together with detailed information.

Wilson Folding Partitions

An attractive four-page folder setting forth the merits of what is known as Wilson folding partitions especially adapted for subdividing large rooms in churches, schools, clubs and other public buildings, has just been issued from the press by the J. G. Wilson Corporation, of 8 West Fortieth Street, New York City, and with factory at Norfolk, Va. Two types of partitions are made, the horizontal one constituting a partition rolling from the ceiling to the floor, while the vertical one is a partition rolling against the side wall. The point is made that these partitions are equipped with a pivoted ball bearing caster easily adjusted to irregularities of floor surface, and that the tracks on which the casters run have the smallest possible guide grooves and as they are flush with the floor they offer no obstruction when used in ball room or gymnasium. Accompanying the descriptive matter are illustrations showing standard types of doors, also details of the construction of the partitions. The statement is made by the company that every detail of the Wilson folding partition is made at its own factory at Norfolk.

The November "Medusa Review"

Various attractive reproductions of houses and garages in which Medusa waterproofing and waterproofed cement has been used are contained in the November issue of the *Medusa Review*, the house organ of the Sandusky Cement Co., Engineers' Building, Cleveland, Ohio. We understand that this publication will be sent regularly without charge to anyone interested in concrete construction, ornamental concrete work, building blocks, etc., in which a white Portland cement or a waterproofing is used. The *Review* contains from time to time valuable practical information for building contractors, architects, dealers, etc.

Stanley's Cam Action Catch

A cam action catch, which is intended for use in connection with cellar windows, storm sash, etc., and which is made of wrought steel, has recently been added to the already extensive assortment of builders' hard-

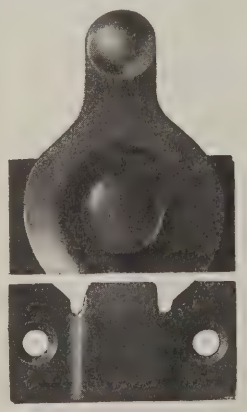


Fig. 2—The Strike Plate



Fig 3—The Catch

ware turned out by the Stanley Works, New Britain, Conn. This catch is held in any position by a tension spring washer which it is claimed prevents it from rattling and working loose. Windows which are stuck

to the sill may be forced open by the lever or cam action of the slanted edge. It is pointed out that by reason of its wide diameter, the catch works satisfactorily even though the crack between the sash and the sill measures 3-16 in. The strike plate for the catch shown in Fig. 2 is hollow shaped so that it will not become clogged with dust or dirt. It is made strong and durable and a catch at the top and bottom of the cellar window or one at each side is all the hardware necessary to hold the sash securely in place, and when coal is being put into the cellar through the opening, the sash can be removed and thus obviate all danger of the glass being broken. To use the catch in this way, the edge of the sill must be flush with the closed sash. In attaching, it is only necessary to apply the edge of the strike to the edge of the sill and the edge of the plate to the edge of the sash; then line up the side edges of the strike with the edges of the plate. The catch shown in Fig. 3 is for use on storm windows as well as cellar windows and at the same time has a screen or sash fastener. The strike is screwed on to the sill. There are two spikes or prongs at the bottom of the strike which grip into the wood and hold the catch firmly in position even through it is fastened with but one screw.

Auto Bus Transportation In Seattle

Some of the larger cities find that transportation problems are difficult of solution and in many sections of the country jitney buses of pretentious or unpretentious ambitions are called into service. Seattle, Wash., has established a high class service which operates on what is said to be a perfect schedule. One concern operates five "Federals" in direct competition with the Puget Sound Traction Company, and recently the city Park Commission, of Seattle, made a contract with the company to carry passengers over two different lines for a period of ten years.

Corbin's Electric Door Opener

We take pleasure in presenting in Fig. 4 a view of an electric lock designed for distant control of entrance doors of apartment houses or other places where it is desired to unlock the door without going to it and which has recently been placed upon the market by P. & F. Corbin, New Britain, Conn. This lock is applied in the usual manner with channels in the door so that connection can be made with the plates at the back of the door which connect with the contacts set in the frame and form a circuit through the medium of the push button and the battery. Pressure upon the push button energizes a magnet in the lock, which releases the latch bolt so that it can be withdrawn by turning the knob. Its connection is different from the ordinary electric opener in that it does not open the door, but simply unlocks it. The act of closing the door again applies the stop to the latch bolt and locks the door from the outside. The inside knob is always free and the door always unlocked from the inside. The door, however, can always be unlocked from the outside by means of a key. In size the lock measures 5 5/16 x 3⅝ x 1 in. and has a cast bronze front 7¼ x 1¼ in. The backset is 2¾ in. and the space between centers of hub and cylinder 3¼ in. It has a broad swinging latch bolt with 17/32 in. throw.

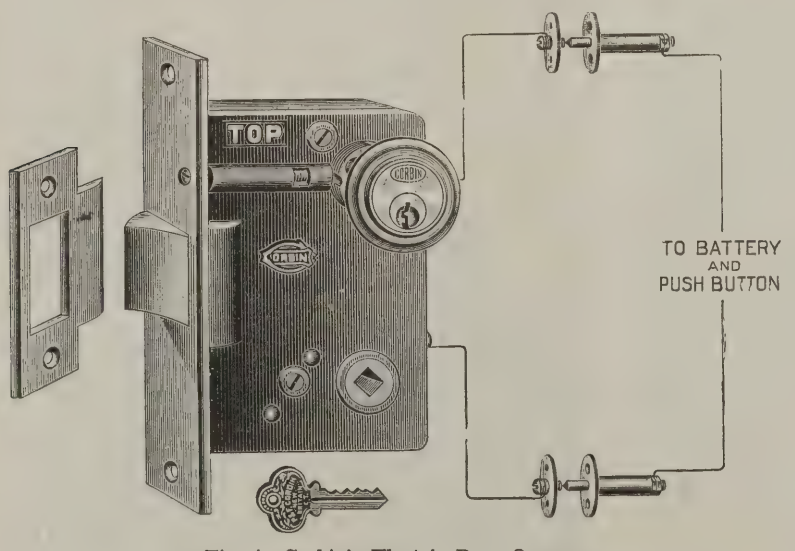


Fig. 4—Corbin's Electric Door Opener

Modern Walls and Ceilings

As a part of its educational work with the prospective home builder, and with a view to influencing him to build better homes, the North Western Expanded Metal Company, 904 Old Colony Building, Chicago, Ill., has just issued from the press an exceedingly attractive publication of thirty-two pages relating to modern walls and ceilings for residence construction, and which is intended for free circulation among prospective house owners, architects and building contractors. It is a well-known fact that substantial walls are an important feature of any building. They must not only render satisfactory service as regards carrying capacity and resistance to the weather, but they should also be fire-resisting and be finished in a way that will add to the beauty and attractiveness of the rooms within as well as to the appearance of the building without.

In discussing the matter the publication says: "Regardless of the materials used in the construction of a building, the inner faces of exterior walls, both faces of all interior walls and all ceilings must be plastered, the only exception being when the building is designed for a purpose where an attractively finished interior would be of no advantage.

"Plaster may be applied directly to stone, brick, tile or concrete, but the results are not so satisfactory as when the plaster is applied to lath properly furred out from the masonry. The mere adhesive strength of plaster is not sufficient to securely bond it to masonry without the use of some mechanical bond. This is accomplished by covering the face of the wall with some form of lathing material, preferably a small mesh metal lath such as 'Kno-Burn' expanded metal lath.

"The plaster flows through the meshes of this lath and curls around the strands, forming a 'key' or clinch that cannot be excelled. The whole of the metal lath is completely imbedded in the plaster so that the lath becomes a reinforcement as well as a holding device.

"The attractiveness of the plastered walls and ceilings in any building, and particularly the modern home, depends upon the decoration applied to those walls. It is apparent, then, that pleasing decorations are possible only when the plaster on the walls and ceilings is smooth, free from cracks and devoid of unsightly stains, streaks and discolorations."

The results obtained by the use of "Kno-Burn" expanded metal lath are referred to at considerable length, and the proper method of construction for a frame house, stucco finished, is described, as well as the method where back plastered stucco walls are used. There are several pages given up to the method of "overcoating" houses, this being followed by comments on stucco garages, tool houses, etc., after which we find

(Continued on page 22 of the advertising section)

THE NON-SLOP

Sensation of the 1916 Mixer Season

Wonderful Sales because Wonderful Value

TROUBLE-PROOF
FOOL-PROOF
NON-STOP
AND NO DELAY

More power than any other mixer of the same capacity

Stocks at All Large Cities



"A MIX A MINUTE"

5-FOOT MIXER
10-FOOT MIXER

They never slop with the regular charge

Write for Bulletin No. 5
Giving Sizes and Prices

NORTHWESTERN STEEL & IRON WORKS

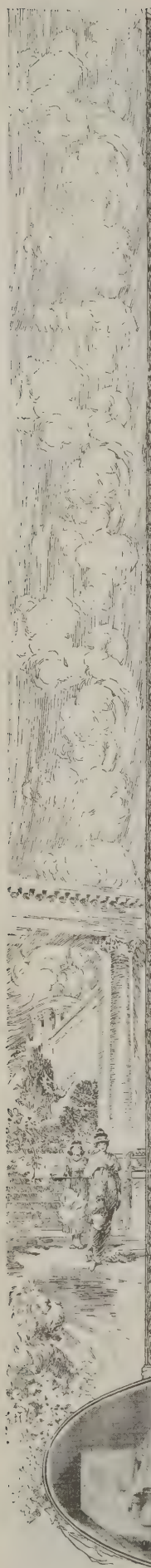
CAPITAL STOCK $200,000.00

EAU CLAIRE, WIS.

"The House of Good Service"

See It at the Chicago Cement Show

"NORTHWESTERN"



The bath as it was —and as it is

In ancient Rome bathing was a luxury—a function attended with magnificent formalities. Today the bath tub is a regular part of the equipment of the home.

More and more, the people of our time are insisting that their bathrooms shall be made attractive as well as hygienic by the installation of

KOHLER WARE

—Always of one quality— the highest

In the designing and construction of bath tubs, lavatories and sinks, as well as in the art of enameling, we maintain *consistent supremacy.*

The *attractiveness* of KOHLER WARE shows for itself; the *quality* is guaranteed by our permanent trade-mark in the enamel.

Although representing the greatest advancement in bathroom luxury KOHLER WARE, owing to manufacturing economies, is *moderate in price.*

To Builders

The "Viceroy," our latest built-in bath has *exceptional* attractions. It is being specified for the finest homes, apartments and hotels. Owing to manufacturing economies we are able to maintain a moderate price on this *very beautiful* one-piece tub.

Write for free copy of our instructive book "KOHLER OF KOHLER."

"It's in the Kohler Enamel"

KOHLER CO.
Founded 1873
Kohler, Wis., U.S.A.

BRANCHES

Boston New York Philadelphia Atlanta
Pittsburgh Detroit Chicago
Indianapolis St. Paul St. Louis Houston
San Francisco Los Angeles
Seattle London

The "Viceroy," Plate V-12-A [Patent Applied For] *Columbia Lavatory, Plate K-205-A*



(Continued from page 50 of the Editorial Section)

the closing portion of the publication devoted to "Kno-Burn" expanded metal lath, its stock sizes, weights, finishes, etc. There is also to be found some useful information regarding "Kno-Fur" expanded metal lath, which is a type so designed as to eliminate the necessity of using furring strips which cannot be avoided when a flat sheet lath like "Kno-Burn" is applied over sheathing or wood studding. "Kno-Fur" metal lath is referred to as being particularly adapted for use on exteriors as a support for stucco. It is said to be the ideal metal lath to use in the overcoating of old houses, as the ribs permit it to be used directly over the old weather-boarding of the building without any other furring, or it can be applied directly to the sheathing in case the weather-boards must be removed. The work is illustrated by numerous half-tone engravings of houses in connection with which the company's product has been used.

New Campaign of Morgan Sash and Door Co.

Beautiful doors add much to the attractiveness of a home and the new campaign being inaugurated by the Morgan Sash and Door Co., Dept. A-21, Chicago, Ill., with the idea of helping the building materials dealer, will undoubtedly prove of great value, in educating the public along these lines. The plan is to endeavor to influence the owners of old homes to modernize their property by showing how a Morgan door would improve and beautify, as well as to impress prospective builders with its merits. To aid in this, the company is prepared to furnish without charge, and with the dealer's name attached, artistic inserts for the dealer's regular mail, motion picture slides and newspaper electros all ready to run, an outline of a sales and advertising campaign, the referring of all local inquiries to the dealer and thorough co-operation in every possible way. Besides these helps, an attractively illustrated booklet entitled "Adding Distinction to the Home," is furnished with the dealer's imprint. This booklet features French, Front and Mirror doors, telling the "improve" story effectively. A 9x12 in. booklet entitled "Sales and Advertising Helps for Morgan Dealers," is being distributed to dealers, and contains a description of the ways by which help is given to the dealer. Fac similes of the newspaper ads, lantern slides, etc., are contained therein so that from them the dealer may choose those which please him best.

Southern Sales Department for "Ripolin"

The trade will be interested in learning that arrangements have been completed by J. A. & W. Bird & Company, 88 Pearl Street, Boston, Mass., to have George Price, who has been manager of the New York office, at 120 Broadway, and who for the past eight years has handled the metropolitan district, to hereafter engineer and handle the sales department for "Ripolin" enamel paint covering the entire territory south of New York and as far west as the Mississippi River. The territory is also to include Louisiana and Texas. The selling policy, it is understood. will remain practically the same, but with a larger number of distributers, the scheme is to have the present agencies concentrate on more limited territories. By this arrangement the company places a "Ripolin" distributer in practically every city of 5000 inhabitants and upward, developing a material advantage to the painter and convenience to the architect in the way of co-operation and more prompt deliveries. We understand that the placing of this territory under the control of New York, including the installation of additional salesmen under its supervision and the plan of concentration, was found necessary on account of the enormous increase in the volume of business. The distributers state that they have not found it necessary to mate-

(Continued on page 24)





QUICKER SERVICE— BIGGER PROFITS— BETTER GOODS— and Guaranteed Prices!

IF for no other reason than that **every** Gordon-Van Tine price is **Guaranteed,** you should have this book as a **buying guide.**

Remember, the very fact that our prices are all **printed** is your assurance of **fair treatment and one price to all.**

This, and the fact that we sell at **wholesale,** is the secret of why **we serve 15,000 Contractors.**

For our **printed** figures **protect your prices** and permit you to estimate on work and **be sure of your profit.**

These progressive builders and carpenters have proved that our service and material is **right** and that we are making money for them. We are. And we can make it for you, too. Make us deliver the proof. We can.

Send for This Book of 5000 Building Bargains

Here are a few pages from our 156-page, color-illustrated catalog of 5000 Extraordinary Bargains in Building Material. **Lumber at a saving of $100 to $300 a car.** Millwork in special designs for immediate shipment. No waits. Crammed from cover to cover with money-savers. A veritable Builders' Encyclopedia. The book that **creates low prices.** FREE on request.

Remember, every single one of the entire 500 items in our catalog is sold under our famous legal-binding guarantee. We guarantee our **quality** to be the very highest. We guarantee **prompt and safe delivery** to you—**anywhere;** it makes no difference where you live. And we guarantee **absolute satisfaction** or refund your money. Send us the coupon **today** and let us mail you this FREE book.

Gordon-Van Tine Co.

Satisfaction Guaranteed or Money Back

847 Federal Street, Davenport, Iowa

GORDON-VAN TINE CO. 847 Federal St., Davenport, Iowa.

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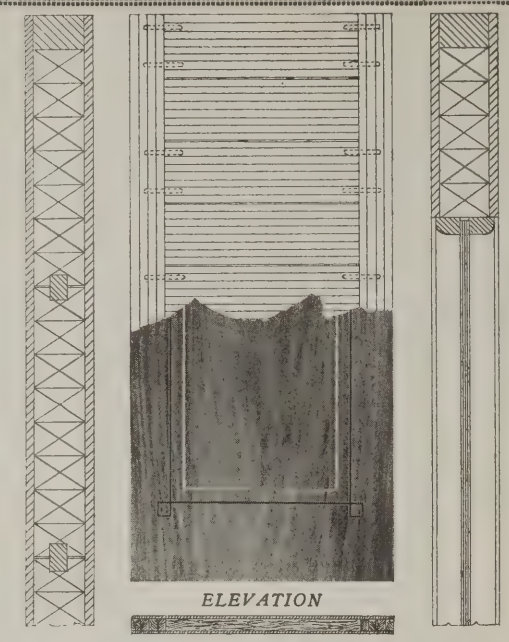
- ☐ Building Material Bargain Catalog
- ☐ Gordon-Van Tine Home Plan Book
- ☐ Barn and Out-Building Plan Book
- ☐ Lumber, Millwork, Hardware, Paints, etc.
- ☐ Garages—Ready-Cut and Portables
- ☐ Roofing Samples
- ☐ Summer Cottages

Name .....

Street No. .....

City ..... State .....

Occupation .....



We take pleasure in calling your attention to the construction of our "No Warp" Sanitary Doors, as illustrated above. They are made in the best manner, having cores formed of thoroughly seasoned laminated Chestnut stiles and rails, cross-framed and doweled together, and covered with 1-8 inch face veneers, and WILL NOT WARP OR TWIST.

We recommend them in all cases where sanitary doors are desired, and guarantee them for one year against defects due to the use of improper material or defective workmanship.

Manufactured by

HYDE-MURPHY COMPANY, Ridgway, Pa.

New York Office, 10 East 43d St.

Pittsburgh Office, Liberty Bank Bldg.

M&F Fiberlic

Fiberlic Wall Board

Fiberlic Wood Grain Panels

The material from which it is made is in itself a guarantee of the superiority of FIBERLIC for strong, permanent and economical construction.

MacAndrews & Forbes Company

200 Fifth Avenue, New York City

Factory: Camden, N. J.

rially increase the price of "Ripolin," as they are receiving from abroad a much greater amount of material than before the war, owing to the falling-off in the European demand.

"Creo-Dipt" Stained Shingles for Side Walls.

There has just been isused from the press an exceedingly attractive folder setting forth the merits of large 24-in. "Creo-Dipt" shingles with heavy butts and wide exposure for use on side walls of buildings. These shingles are becoming very popular with architects, builders and house owners for use in connection with the Colonial type of architecture, more especially so when treated with "Creo-Dipt" Dixie White, which is said to give the whitewashed effect. This attractive folder is sent out by the originators and sole manufacturers, the Standard Stained Shingle Co., 1030 Oliver Street, North Tonawanda, N. Y. Another folder gives special attention to "Creo-Dipt" Dixie White, which is referred to as a successful white shingle stain which when given one brush coat to "Creo-Dipt" shingles in shade No. 207, will produce the desired whitewashed effect. The claim is made that one gallon of this material will cover from 125 to 150 square feet when applied one brush coat. We understand that copies of either or both of these folders may be obtained by any reader of the paper who will make application to the company.

Silent High Speed Chain

The sanding drum of a floor sander is said to revolve at a speed of from 700 to 800 revolutions per minute and this high speed, combined with the short distance between the sanding drum and electric motor, makes a chain drive rather than a belt drive more satisfactory. There are various types of chains upon the market, and the particular kind known as the silent high speed chain, shown in Fig. 5, is said to be a most efficient type in connection with floor sur-



Fig. 5—The Silent High Speed Chain

facing machines. This chain is one of the features of the machines made by the American Floor Surfacing Machine Co., 521 South St. Clair Street, Toledo, Ohio, and is claimed to be flexible as a belt, to operate without noise and to be a positive drive of high efficiency. Its smooth running is due to the peculiar action of the links, which grip and release the sprocket teeth instead of sliding over the surface, as is the case with some other types, and it is claimed to do away with the prevalent sprocket friction and wear. It is said that other types of chains waste from 15 to 20 per cent of the power consumed, whereas, the silent high speed chain wastes only 1 per cent.

Upson Wall Board

Announcement has been made by the Upson Co., 20 Upson Point, Lockport, N. Y., that they have devised a comprehensive campaign by using which any carpenter can quickly, and at virtually no expense, build up a profitable trade in wall board installations. A feature of this plan is that, after the carpenter's first efforts, his wall board business increases automatically and continues to grow. The quality of Upson Board is an important factor contributing to the success of the campaign. This wall board is claimed to be standardized for strength, permanency and finishing

(*Continued on page 26*)



Their Shape Saves You Money

WHEN you bid on a roofing job, remember these big features of FLEX-A-TILE Slab Shingles: Besides giving highest grade materials and enduring quality, FLEX-A-TILES in their new Slab form actually save the contractor over *50% in labor, 35% in freight* and *38% in nails.* It is as easy to lay a FLEX-A-TILE Slab of four shingles as *one* individual shingle. No chalk-lining is necessary. Their saving on material means less freight. And *five* nails do the work of *eight*, with

FLEX-A-TILE
Asphalt Slab Shingles

The durability, beauty and economy of an asphalt roof are best shown when FLEX-A-TILES, the standard among asphalt shingles, are used. For the client they mean a better roof, cheaper than wood; for the contractor, time, labor and materials saved and a job done *right*.

The strength and long life of FLEX-A-TILE Shingles is due to the Heppes method of manufacture. Thick wool felt is saturated in twice its weight of the best grade, high-melt-point asphalt, coated with rubbery gilsonite and surfaced with crushed slate or granite under tons of pressure.

FLEX-A-TILE Slabs are made in three styles in colors deep red or rich green. Many beautiful decorative effects are thus obtainable. The colors come from the natural stone surfacing and *improve* on weathering.

Sample Sent on Request

with prices and complete information of FLEX-A-TILE Slab, Roll or Individual Shingles. Write today.

More Live Agents Wanted

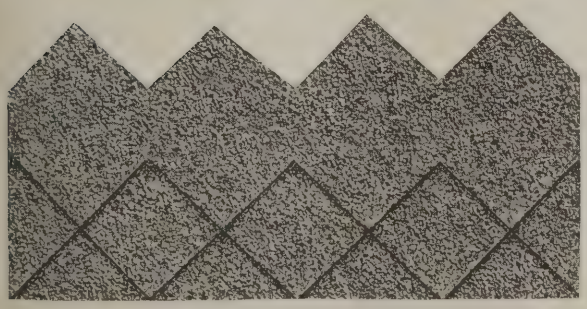
We have an attractive agency proposition for some territories still open. If there is no local FLEX-A-TILE dealer, write for details of our offer.

THE HEPPES COMPANY

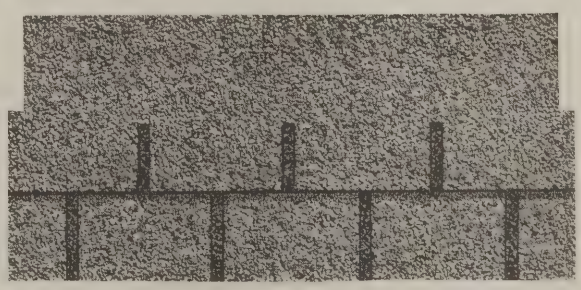
Dept. M-1011 Kilbourne Ave., Chicago, Ill.

FLEX-A-TILE Roll Shingle ***Utility Board*** ***No-Tar Asphalt Paint***

Other Guaranteed Heppes Products



FLEX-A-TILE Diamond Point Slab, laid in American Diamond Style



FLEX-A-TILE Style 4 Slab, laid in American Shingle Style



OSHKOSH

LOW LOADER for Fast Work

The *Oshkosh* is the best and most rapid deliverer of concrete yet built.

This means fewer hands and less pay-roll. Notice the easy, rapid loading, direct from wheelbarrows on the low platform, insuring a great saving in time and labor. The *Oshkosh* will deliver more concrete than many machines with greater rating and is a money maker for every contractor.

Send for "Facts and Figures for Cementmen."

MEMBER OF NATIONAL ASSOCIATION OF MIXER MFRS.

Oshkosh Mfg. Co., 17 Buck Street Oshkosh, Wis.

Chicago—605 S. Dearborn St.
Dodge & Dodge,
140 West 38th Street, New York

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.

Owned and Operated by Nicholson File Company

quality. Its wood-like quality makes it easy to cut, work and install; it is said to show no appreciable shrinking or buckling on the walls; and one or two coats of practically any kind of paint will finish it. Upson Board is effectually waterproofed and is claimed to be unharmed by ordinary leaks. The Upson Co. invites inquiries regarding this business-making campaign for carpenters.

New Stanley Garage Door Hinge

In connection with the article illustrating and describing the new garage door hinge which has been placed on the market by the Stanley Works, New Britain, Conn., an error was made in the picture presented of the hinge. The latter, which takes care of the particular case referred to in the article in question, is shown herewith in Fig. 6 and is known as No. 1456. The purpose of this hinge is to swing a garage door clear of the opening allowing room for getting

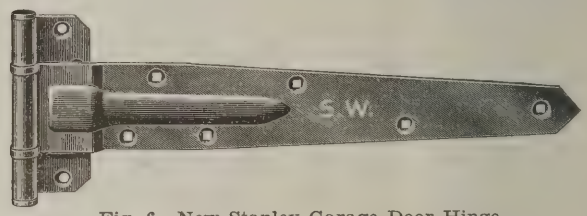


Fig. 6—New Stanley Garage Door Hinge

the car in and out by throwing the door out of harm's way. The strap is 24 in. long and the hinge is particularly adapted to garages with narrow entrances. No mortising is necessary and the hinge is easily applied. There are two holes exposed in the pad, as may be seen from the picture, these being intended for fastening the screws or bolts on the outside. Three screws are covered by the long leaf when the door is closed so that the hinge may not be removed.

Corbin Lever Handles

The hardware of a building is not one of the least important details, and a new folder issued by P. & F. Corbin Co., New Britain, Conn., contains interesting references to lever handles, which are rapidly growing in popularity. Concerning them, the company states: "Lever handles—with their grace and beauty provide a means by which a distinction in the appearance of finishing hardware is secured, and through which individuality of taste finds expression. They are almost universally used upon the narrow-stiled doors of European countries, from whence the idea originally came, and are the best device, the world over, for those doors whose stile does not provide ample hand room between the knob and jamb, or where the knob would come near to the edge of double doors.

"They also have a value in the leverage they give when used with French window bolts and with some special types of locks where the weight to be moved is considerable. It may be stated in general terms that lever handles can, if desired, be employed in any location where a knob is used, and under the conditions just named are considered preferable to knobs."

Well executed engravings show various styles of lever handles in conjunction with suitable roses. Any desired combination of handle and rose can be made, or the handles can be used with escutcheons instead of roses. Pleasing effects are secured by the use of lever handles on roses, and with old-fashioned key-plates. With the heavier handles, proper provision is made for counterbalancing the weight. This is done by means of a compensating spring inserted under the escutcheon or rose, or in some instances, introduced into the lock mechanism.

(*Continued on page* 28)



Lansing No. 5 "Half-Sack" Batch Mixer

A money maker for sidewalk, curbing, small foundations—in fact, any job not requiring over 30 or 50 cubic yards per day.

Fits the average builder's requirements perfectly. Many other sizes to choose from. By all means get Catalog No. 21. Be prepared and watch your bank account grow.

What Building Contractors Are Saying About This Lansing Mixer

J. W. Yarrington, Broadway, Ohio.—*I think it easily the best mixer on the market.*

Perkins Bldg. & Supply Co., Lakeview, Michigan.—*It has never lost me one moment's time in 18 months.*

Edward Geschke, Collingswood, N. J.—*Your mixer is fine, and there are none in this territory its equal.*

F. C. Krotter, Palisade, Nebr.—*Our work requires very thorough mixing and it is just the machine for us.*

D. R. Stiles, Argentine, Michigan.—*I consider that this mixer has paid for itself in two months.*

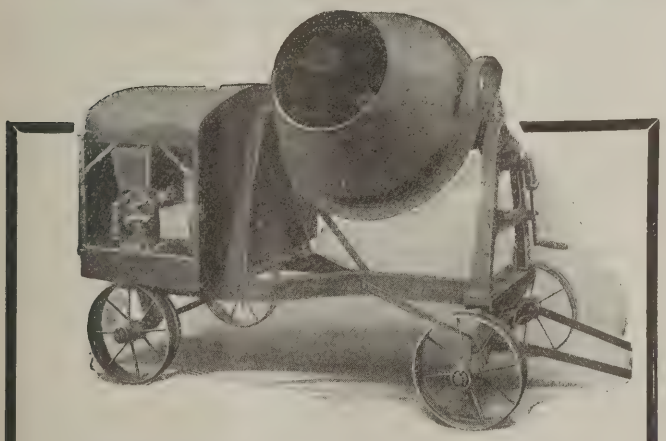
Manford Werking, Mt. Vernon, Ind.—*I have used three different mixers and the Lansing has them all beat.*

Hundreds of similar expressions and enthusiastic reports from every part of the country are reaching us. No mixer ever enjoyed a greater popularity.

LANSING COMPANY
"KEEP YOUR PRODUCT ON WHEELS"

LANSING, MICH.

CHICAGO—167-169 W. LAKE ST.
NEW YORK—288-289 WEST STREET
PHILADELPHIA—COR. N. AMERICAN & WILLOW
SAN FRANCISCO—338-348 BRANNAN ST.
KANSAS CITY—1413-1415 W. 10TH ST.
BOSTON—78 CAMBRIDGE ST., CHARLESTOWN DIST.
MINNEAPOLIS—517-519 N. THIRD STREET

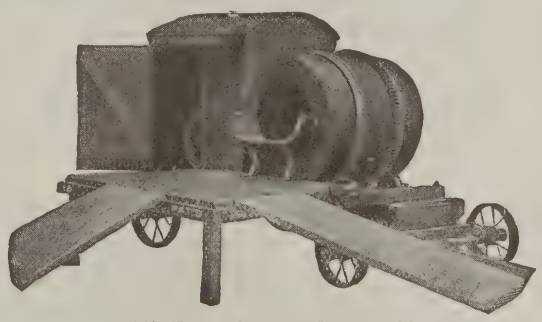


What 1916 Taught Mixer Users—

1916 showed the purchasers of Jaeger Mixers that their only mistake was they had delayed the purchase of their mixer so long.

1917 Models are better than all former ones—many improvements are embodied in them. Start getting your mixer now by first asking for a complete catalog at once.

The Yaeger Machine Co.
216 West Rich Street Columbus, Ohio



"The Standard" Low Charging Concrete Mixer

will enable you to do your concrete work during winter weather on account of the low charging platform which is only 24" high. It avoids the necessity of using troublesome and heavy side loaders or high charging hoppers.

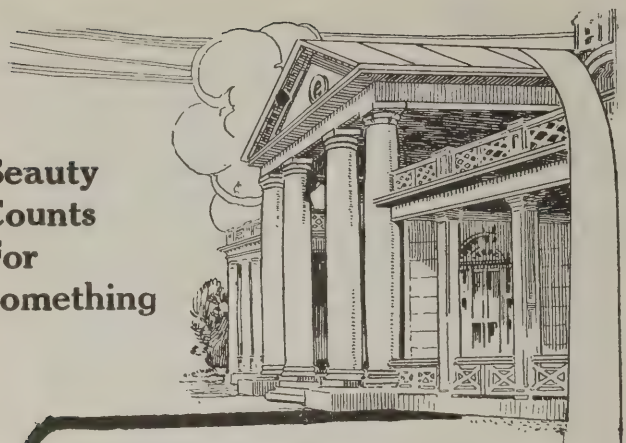
"The Standard" can be placed inside the building and moved along the work and from floor to floor. Its light weight and sturdy construction make this possible.

"The Standard" is built in 10 sizes from 3 to 40 cu. ft. per batch. Catalog No. 48-1 will be mailed on request.

Visit us at the Chicago Cement Show, Feb. 7-15, 1917. Spaces 182, 183, 184 and 185.

The Standard Scale & Supply Co.

CHICAGO 1345-47 Wabash Ave.
PITTSBURGH 1631 Liberty Ave.
PHILADELPHIA 523 Arch St.
NEW YORK 145 Chambers St.
CLEVELAND 1547 Columbus Road



Beauty Counts For Something

The perfect house is not merely a substantial structure—built for utility alone. It combines with its utility the quality of beauty. Every line is graceful—true—pleasing to the eye.

This necessary beauty can be obtained, and the utility enhanced by the use of

Bayonne Roof and Deck Cloth

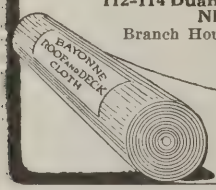
Water-proof, weather-proof and wear-proof, it can be sluiced clean like cement. Unaffected by changing temperature.

Bayonne is easier and more economical to lay than any other material. Offers unusual possibilities of painting and finishing.

Recommended for roofs, sleeping porches, conservatories, piazzas, etc.

Write for Sample Book D, giving prices and instructions for laying.

JOHN BOYLE & CO., Inc.
112-114 Duane Street 70-72 Reade Street
NEW YORK CITY
Branch House, 202-204 Market Street,
St. Louis, Mo.



This Roof Stands as a Permanent Advertisement for You

More than that—it's the roofing that's most profitable to you. There is a good profit on each individual sale; profit in the ease with which it can be handled and applied. A roof of

AMBLER
Asbestos Shingles

is absolutely the best roof you can give a customer. A joy to his eye—and a roof which will never cost him a cent over and above its first cost. Ambler Asbestos Shingles are made of Portland Cement reinforced with Asbestos fibre; they are FIRE, TIME and WEATHER proof. Just as suitable for sidings and renewal work, as for new roofs.

Let us send you facts and pictures—samples, too. Write today.

KEASBEY & MATTISON CO., Dept. B-2, Ambler, Pa.

Residence: Robert Damerell, Red Cloud, Neb.
Architects: Way & Company, Hastings, Neb.



Compo-Board as a Building Material

Although originally placed upon the market as a wall lining with several advantages claimed for it as compared with lath and plaster, the patented product known by the name of Compo-Board has not only met with great popularity in its primary use as a wall lining, but has come into wide favor for use in stores, offices and theaters for partitions, screens, telephone booths, window display backgrounds and exhibition booths; also in factories for wall cases, kitchen cabinets, stage scenery, drawer bottoms, backing for pictures, lining for incubators, refrigerators, etc. It is well adapted for making the bodies on moving vans and delivery wagons by reason of its lightness and strength, as well as of the roofs of limousines and other closed cars; also on the farm for lining barns and poultry houses, and for making many useful articles, such as cabinets, tool racks, lapboards, etc. It is in use on ocean-going steamships, as well as in all types of houses, whether it be the simple cottage of the workingman or the palatial mansion. The point is made that it is adapted for more than one hundred different purposes in addition to its principal use as a wall lining. An illustrated folder which the manufacturer—The Compo-Board Company of Minneapolis, Minnesota—is distributing among architects and builders, sets forth the merits of the material and also carries pictures indicating in a very general way some of the very many uses to which it may be applied.

Exhibit of Standard Sanitary Mfg. Co.

The model bathroom display at the National Hotel Men's Exposition, held at the Grand Central Palace, New York City, and arranged by the New York office of the Standard Sanitary Mfg. Company, 35 West Thirty-first Street, included a Pembroke tub of the recessed pattern, with concealed fittings and shower bath with curtain, mixing valve and water supply regulated by key valves; Devoro closet of the siphon jet type, and Blackford pedestal lavatory with Alton fittings. The feature of the water closet was an oil-regulated flush valve controlled by a push button in a pocket or chamber bulging out slightly from the right-hand side of the closet. The closet is of Vitrite china, and has an Ivorite seat which harmonizes with the color scheme of all white throughout. The bathroom accessories were complete, including towel racks, metal wall basket for soiled towels, recessed medicine closet, toilet-paper rack, and soap dish for bathtub and glass shelf for lavatory. The booth attracted much favorable comment, and many interested hotel men stopped to hear why a built-in tub was the most satisfactory type for hotels, why all fittings should be concealed, and why hotel water closets should have flush valves.

Advance in Price of "Highwood" Dumbwaiter

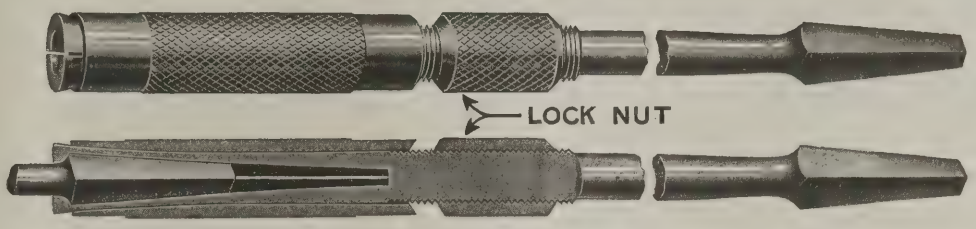
By reason of the increase in the cost of raw materials and in the wages of labor the Highwood Dumbwaiter Company, Park Avenue, Leonia, N. J., makes announcement that the price of its dumbwaiters has been advanced from $17 to $19.50. The company also desires to announce to all subscribers of the BUILDING AGE that it will protect them on any estimates they have furnished in which they have used the former price. This offer, we understand, will hold good until Feb. 1, 1917.

How to Build Your Garage

A good garage is a necessity to the motorist, for it protects his investment in the car and forms a decided asset to a property. The large automobile output—it being said that there is to-day in the United States one pleasure car for every sixth family—renders their housing a matter of importance to the builder. Various features of convenience are, in the

(*Continued on page* 30)

Stanley Tools



STANLEY EXTENSION BIT HOLDER

Used in connection with a Bit Brace, it will extend the Bit, enabling the user to bore through walls, floors, etc., where the ordinary Bit will not reach.

The Socket in which the Bit rests and the Shank for its entire length are of one piece of steel.

Note how the shape of the Socket conforms to the Shank of the Bit. This form of construction, together with the improved Lock Nut, makes it impossible for the Bit to work loose while boring.

Any length Holder will follow up a 5/8 inch Bit. Heavily nickel plated and highly polished. Made in six different lengths.

MANUFACTURED BY

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

The largest plant in the world; up-to-the-minute equipment, and 76 years of specialized experience are behind



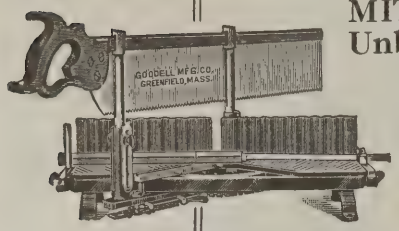
DISSTON SAWS

That's why there are probably more of them used than all other makes combined.

The carpenters know who make the best tools.

Henry Disston & Sons, Inc., Philadelphia, U.S.A.

GOODELL PRATT
1500 GOOD TOOLS

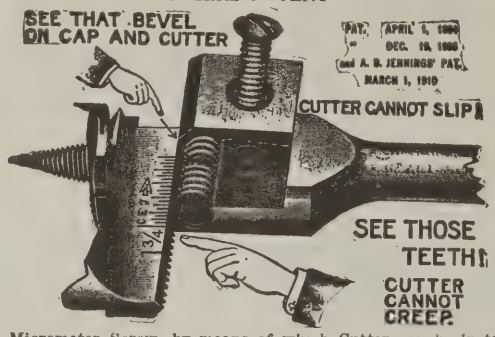


ALL-STEEL MITRE BOX
Unbreakable

Many Special Features
Circular Free to You
Goodell-Pratt Company

Toolsmiths
Greenfield Mass., U. S. A.

C. E. JENNINGS EXPANSIVE BIT
STEERS PATENT



Note Micrometer Screw, by means of which Cutter can be instantly adjusted to a Thousandth part of an inch.

C. E. JENNINGS & CO. *Sole Mfrs.* 71-73 Murray St., N. Y.

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x 7/8", weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-388 Progress St. Pittsburgh, Pa.



Something For You

in our Pamphlet 29; viz.:

Valuable Tables for finding size of joist, safe load of joist, actual load on hanger, etc., etc.

Some of these Tables are not in print elsewhere.

The Pamphlet and the Mounted Model Hanger will be mailed on request.

SOMETHING FOR US. We ask your special attention to items 5, 6, 7 on page 5 of the Pamphlet and to the matter on pages 23 and 24 relating thereto.

The W. J. Clark Co.
Salem, Ohio, U. S. A.

end, economical to the owner, and a description of them is of value to the builder, enabling him to offer worth-while suggestions. The builder will find much to interest him in "Your Garage, How to Build It," published by the National Lumber Manufacturers' Association, Trade Extension Dept., Chicago, Ill. The purpose of the booklet is to show the construction of the low-cost frame garage together with various conveniences which may be incorporated. To this end, plans, elevations and constructive details of two one-car garages and two two-car garages are given together with the plan and elevation of a six-car garage.

Fire Door Hardware

The Richards-Wilcox Mfg. Company, Aurora, Ill., has issued from the press what is known as "Catalog No. 14," devoted exclusively to fire-door hardware. This covers a great variety of work, and in connection with the illustrations are tables giving prices, size of opening, weights, etc., etc. Where it is mentioned that the hardware is "approved" it will be found included in the list of fire-door hardware examined under standard requirements of the National Board of Fire Underwriters, after exhaustive investigation by the Underwriters' laboratories, and approved for use. These fixtures bear their label and are made in accordance with their rules governing the various types of standard equipment. The company states that it can also furnish hardware to meet special requirements, and directions for ordering are set forth at considerable length.

Handbook on Reinforced Concrete Construction

Engineers and contractors concerned with the building of reinforced concrete construction are as a rule desirous of obtaining all of the latest information and data on the subject. They will therefore be included in the new hand book recently issued by The Berger Manufacturing Company, Canton, Ohio. The book is well illustrated and contains such data as tables of safe loads, specifications for installing and descriptions of proper materials to use for various kinds of construction. Any architect, engineer or building contractor may secure a copy of the book by writing to the company at the address stated.

Catalog of Lighting Fixtures

Lighting fixtures constitute only a small part of the modern home and yet a large field is open for the selection of artistic and appropriate designs. It is in finishing touches such as this that taste and individual preferment of the owner have full sway and make or mar the design of the architect. A wide range of designs of handsome fixtures can not fail to be of interest when the time comes for their selection and therefore a new catalog of the Wesco Supply Co., St. Louis, Mo., entitled "Lighting Fixture Catalog Number 230" will prove of value. Residence fixtures of both the direct and semi-indirect type of lighting are illustrated, a few of them being pictured in colors. There are also included church, store and office fixtures and outdoor brackets, electroliers, glassware, andirons, fire sets, etc. An index enables the location of each fixture in the catalog to be found without trouble.

TRADE NOTES

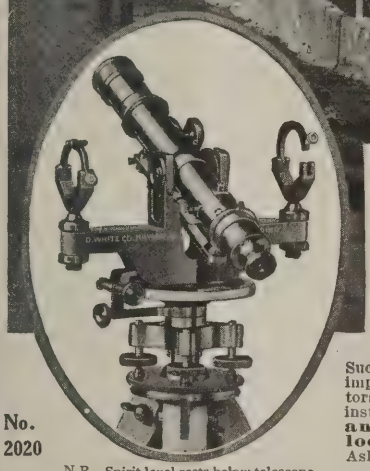
The laws which have been passed during recent years, making it cumpulsory for the manufacturer to protect belts, gears and moving parts of machinery, have developed a new use for expanded metal as a material for the safeguarding of such dangerous places. Interesting information along these lines is to be found in a booklet entitled "Econo," distributed by the North Western Expanded Metal Company, 904

(*Continued on page* 32)

$1,000,000 Plankinton Arcade Bldg., Milwaukee. John H. Parker Co., Contractors, New York, N. Y.

White Convertible Level Used on Big Work

The Up-to-date Instrument for the Up-to-date Contractor



No. 2020

N.B.—Spirit level rests below telescope, protected, when used as transit. Focusing nut always on right hand side.

Accuracy
Durability
Compactability
Portability
Simplicity

Such are the qualifications of the **"White" convertible level.** On big job and small job alike this improved instrument is daily giving lines and levels **accurately and quickly** to hundreds of contractors. Why not profit by their experience and secure one of these **moderate-priced and up-to-date** instruments to use on your work. **"White" levels are absolutely dependable. Accuracy and durability are built right into them.** Standards and bar are cast integral with **no loose parts to get out of adjustment or lost.** Instantly convertible from level to transit. Ask for circular and free trial offer—now.

DAVID WHITE CO., (Inc.) **421 E. Water Street, Milwaukee, Wis.**



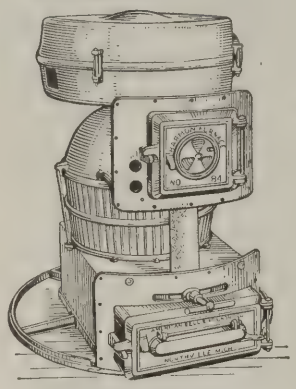
That Carborundum Niagara Grinder Puts New Life Into Any Edge Tools—

MY plane bit for instance was way off—needed grinding. On one corner of my work bench is the ever handy Carborundum Niagara Grinder. A few turns and the bit is sharp—you never saw a wheel that cuts so clean and quick as that Carborundum Wheel. Every Niagara Grinder has one. ¶ Then a couple of rubs on a Carborundum sharpening stone and my plane bit has a keen, smooth edge that will stand up on the job. ¶ That Carborundum Niagara Grinder is a dandy tool. Easy and smooth running—well made—durable—every one of you fellows should have one.

Ask your hardware dealer. Send for the Carborundum catalog.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

Hold on a Minute!



There's no need of figuring any further until you know whether your prospect wants his heating system piped or pipeless.

We can satisfy him either way. Illustration shows our Harmon Piped Furnace — all cast-iron as you see it, without the casing.

May we help with your specifications?

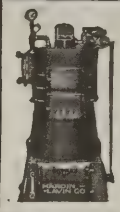
American Bell & Foundry Co.

Northville Mich.

1/3 SAVED Buy Direct From MANUFACTURER



FREE BOOK



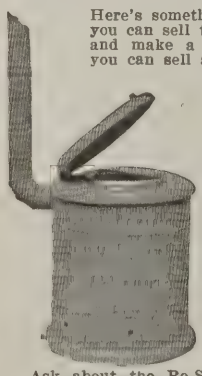
Do Your Own Plumbing and Heating NEW HARDIN EASY WAY

Get our "Handy-Man" Free Book. Every home needs it. Shows new home improvements and everything in **plumbing and heating supplies** EXCLUSIVELY at wholesale prices—complete heating plants, bathroom outfits, sinks, pipe, fittings, water systems, lighting plants, etc. **Any handy man** can install our goods with this free book and free easy installing plans. $500,000 plants behind our guarantee. **WRITE TODAY.**

The Hardin-Lavin Co. 40 yrs. at 4538-48 Cottage Grove Ave. **Chicago**

MR. BUILDER:—Increase Your Income Right Now—This Month

Here's something right in your line—a Chemical Closet that you can sell to a home builder cheaper than a wooden privy and make a bigger profit for yourself. Here's something you can sell at odd times or turn over to your son or your foreman to sell.



RO-SAN Chemical Closet

An absolutely sanitary, odorless indoor closet that may be placed anywhere in the house. Abolishes the germ-breeding outdoor vault. A comfort and a convenience where there is no sewer connection. Germs killed by chemical. Easily emptied as the ash pit of a stove.

AGENTS WANTED

We want one live carpenter contractor in each town to act as our agent. Hundreds of builders are selling these fixtures. Good profits for little work. We help you sell them. Write today for complete details.

ROWE SANITARY MFG. CO.
103 Sixth Street Detroit, Mich.

Ask about the Ro-San Washstand. Hot and cold running water without plumbing.

BUILDING TIME

Soon there will be a demand in all localities for men to build new barns.

This call is welcomed by the contractor who uses *PORTER SERVICE*, since he knows he can build the new barn in double-quick time and guarantee a thoroughly modern and workmanlike job.

Consider what it means to receive authentic and practical data covering the construction, arrangement, ventilation, etc., of each *individual* barn. That's what *PORTER SERVICE* renders—and it's *FREE*.

SERVICE
that which identifies
PORTER BARN EQUIPMENT

The name *PORTER* is identified with that practical and durable kind of *BARN EQUIPMENT*.

J. E. PORTER CO., 638 Fremont St., OTTAWA, ILL.

Old Colony Building, Chicago, Ill. Illustrations showing the material in use and also full sized halftones of the various meshes help to make the text valuable to those interested in the uses of expanded metal.

On account of rapidly increasing business, the Ransome Concrete Machinery Company, of Dunellen, N. J., has just opened another factory at Reading, Pa. This will double the out-put of the company in the line of small mixers and road paving machinery.

The International Floor Machine Co., 39 and 41 West Thirty-eighth Street, New York City, held impromptu exhibitions of the ability of the International Floor Machine on the floor of the Grand Central Palace at the recent National Hotel Men's Exposition in New York City. It is said that the machine can be connected to any electric light fixture and, by changing discs, can be used for grinding terrazzo, marble mosaics and composition floors, sandpapering, wax polishing, etc. The machine is said to be easily controllable, for by lifting the handle slightly it will travel to the right and by depressing it the machine will travel to the left. An illustrated booklet containing description and instructions for use can be obtained from the manufacturers.

In the November issue of 'Knickerbocker Komments," the house organ of the Knickerbocker Portland Cement Co., New York City, light is thrown on the following questions: "Will cement tend to do away with cemeteries? Can concrete be used as a selling argument for other wares? Why should insurance companies favor stone or brick as against cement?"

Users of saws will find interesting information concerning the tool in the *Disston Crucible*, issued by Henry Disston & Sons, Philadelphia, Pa. Besides making saws, the Disston employees showed that they know how to play baseball, by winning the 1916 championship of the Industrial League of Philadelphia.

A new booklet entitled "Suggested Specifications for Concrete Floors," which is being distributed by the Portland Cement Association, 111 West Washington Street, Chicago, Ill., carries interesting information concerning the proportions of various mixtures used in both reinforced and plain concrete flooring, their laying and finishing, protection during laying, the manner of preparing the sub-grade, etc. Various information concerning aggregates, the addition of coloring matter, forms, reinforcement, etc., contribute to make the booklet especially valuable to the user of concrete.

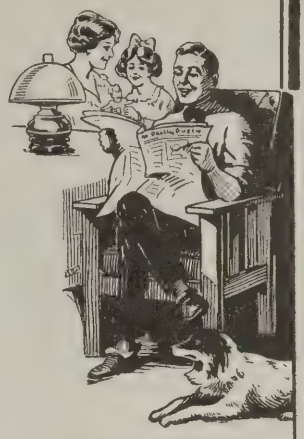
The Federal Motor Truck Company recently shipped a 3½-ton Federal to Christiania, Norway. The truck was a power sprinkler equipped with a 1000-gallon tank body.

The main feature of the December issue of Door-Ways, the house organ of the Richard-Wilcox Mfg. Co., Aurora, Ill., is a reproduction of one of the recent articles on "Arrangement of Sliding Partitions," which appeared serially in the BUILDING AGE a short time ago. Another interesting article is, "Why the Architect and Contractor Should Advertise," and various strong arguments are presented in favor of proper publicity. A calendar for December accompanies the monthly and contains an attractive picture of a young and pretty mother holding up her baby. A caption entitled "Example," has its meaning relative to "R-W" products explained on the reverse side of the calendar.

One of the most interesting house organs which we have received for sometime is the "Buick Bulletin," a copyrighted monthly issued by the Buick Motor Company, Flint, Mich. It is 10 x 15 in. in size and contains interesting information concerning the Buick motor car, such as the article in the December issue entitled "Efficiency Methods Rule in Making Buick Bodies," in which the various steps of turning lumber

(*Continued on page 34*)

This Onepipe Heater Is Your Opportunity



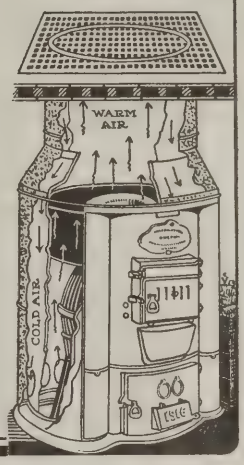
Because you not only specify it, but actually ***sell*** it ***at a profit to you.*** Installation is very simple—requires only hammer, saw and screw-driver, and cutting only one hole in the floor.

INTERNATIONAL Onepipe Heaters

are selling fast, and making good. They are so much better than stoves, so simple and easy to run and cost so comparatively little, that they appeal to almost everybody using stoves for heating. A "Onepipe" heats the whole house but keeps the cellar *cool.*

The "Onepipe" is Advertised Nationally in Rural Publications, sold on 60-day trial, and is guaranteed.

Write at once for Booklet and Agency Offer, explaining this new field for profit and how to avail yourself of it. Address Dept. N.



INTERNATIONAL HEATER CO.
UTICA, N. Y.

Makers of the Largest Line of Heating Apparatus in America. (Steam and hot water boilers, warm air furnaces, water supply boilers, etc.)

Advertisement of the

HESS STEEL FURNACE



The HESS Welded Steel Pipeless Furnace—One large register delivers heat and draws off cold air.

The HESS Furnace NEVER LEAKS—for every seam is riveted and welded. It is EVERLASTINGLY TIGHT.

Two styles—PIPELESS, with one hot—and—cold register—or regular, with separate registers and pipes.

BURNS ANY FUEL; hard or soft coal, coke, wood, slack, screening or lignite, and delivers every unit of heat. You can use the cheapest fuel in your neighborhood and get best results; worth considering when fuel prices soar.

EVAPORATES PLENTY OF WATER to properly moisten the atmosphere. Other furnaces, hot water and steam, fail in this.

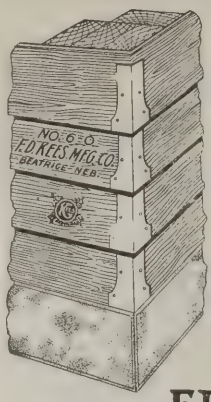
Is sold DIRECT FROM FACTORY TO YOU; factory profit only—and more for your money than you get from dealers.

FULLY GUARANTEED, and sold on trial. No risk to you—for you must be satisfied before we are paid.

PROMPT SHIPMENT. Send us a sketch of your house and we will submit plan showing how to heat it and estimate of cost.

Special rates to Contractors.

HESS WARMING & VENTILATING CO.
1201 Tacoma Building, Chicago



Saved $40 On One Job

One contractor writes that he saved $40 in labor on one job by using $14 worth of

KEES Metal Building Corners

At the same time he gave his customer a better job.

Kees Metal Building Corners take the place of corner boards with lap siding. (Styles also for drop siding.) Made of specially treated galvanized iron. Hold paint like wood. Make a neat, strong, durable, weatherproof "mitred" corner. Anyone can put them on.

Let us send you free samples, also free samples of Kees Gossett window screen and storm sash hangers.

Box 812 **F.D.KEES MFG. CO. BEATRICE.NEB**

Pearson's Automatic Shingle Nailer



Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

PAYS ITS COST ON ONE JOB

Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.

List price $7.00 (but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools



HESS MEDICINE SANITARY CABINET LOCKER

The Only Modern, Sanitary STEEL Medicine Cabinet

or locker, finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimming. Steel or glass shelves.

Costs Less Than Wood

Never warps, shrinks nor swells. Dust and vermin proof, easily cleaned.

Should Be in Every Bath Room

Four styles — four sizes. To recess in wall or to hang outside.

Send for Illustrated Circular

The Recessed Steel Medicine Cabinet



The Outside Steel Cabinet

HESS, 1201-L Tacoma Building, Chicago
Makers of Steel Furnaces. Free Booklet

MACK & CO.



YOU will always feel secure when you use Barton Planes and Edge Tools. The making of keen edged tools that hold their sharpness is our hobby. If your dealer won't supply you we will.

There is some mighty interesting and profitable reading in "The Carpenter's Catalog" and "True Stories." Both free, of course.

Brown's Race & Platt St., Rochester, N.Y.

into the finished body are illustrated and described. A clever bit of fiction, "The Wandering Athlete," tells of the amusing vagaries of a man who earned his livelihood by athletics and how he fell into and out of his jobs. The illustrations are in colors, as is also the cover.

Every employee of the H. W. Johns-Manville Company who had been with the company a year or more was gladdened by the receipt of a Christmas greeting signed by President T. F. Manville announcing the Board of Directors' decision to give a bonus equal to 10 per cent of the year's salary. This action was prompted by the very satisfactory earnings of the company in 1916 and the splendid service rendered by the J-M employees.

A new folder describing "Some of the Many Uses for Fiberlic Wall Board" is being distributed by the MacAndrews & Forbes Co., 200 Fifth Avenue, New York City. Handsome illustrations in colors depict the uses and give valuable hints concerning the various effects gained by its being used in new and old houses, attics, schools, churches, offices, stores, etc.

DEALERS IN CONTRACTORS' EQUIPMENT

If you are absolutely responsible and are interested in selling a successful, high grade line of contractors' equipment, including five popular sized concrete mixers, paving mixers, mortar mixers, hoists and barrows manufactured by a firm established 35 years, let us know at once. We are now making new contracts for 1916 and need a few reliable dealers and agents in unoccupied territories. LANSING COMPANY, Lansing, Michigan.

EXPORT AGENCIES WANTED

An old established firm, thoroughly familiar with the requirements of foreign buyers, desire to represent for EXPORT, a few responsible and competitive manufacturers of Railroad Supplies, Structural Steel, Plates, Sheets, Tin Plate, Bars, Pipe, Wire Products, Pig Iron, Billets, Builders Hardware. Selling for manufacturers at manufacturers' prices. The manufacturers to allow two per cent commission on the gross sales. Can supply financial and business references. Address Box 39-A, care Building Age, New York.

Decorative Concrete

Better Looking, Better Selling Products With Your Present Equipment

We have no machinery or materials to sell—simply the process and formulas for making high grade decorative concrete Exact reproductions of Marble, Granite, Onyx, etc., at ¼ the cost of actual marble. Block Facings, Porch Work, Composition Flooring, Interior and Exterior Trim, Mantles, etc.

You can make Art Marble Wainscoting, Tiling and Composition Floors for a Hall, Vestibule, Bath or Fire Place almost as cheap as hard wood.

ART STONE CO., Box 500 Waynesboro, Pa.

Make a buying as well as a building profit

Order *now* your lumber for late Fall and early Spring jobs. The H-L-F low off-season price on quality lumber, direct to you, will mean hundreds of dollars lumber saved—hundreds of dollars extra profit. Send material bills for prices. Send 10 cents for $1.00 Plan Book; 4 cents for Barn Book. Millwork catalog free. Write *quick.*

Hewitt-Lea-Funck Co.
459 Funck Street Sumner, Wash.

HLF SEATTLE **LUMBER**

CEMENT SHOW NUMBER

BUILDING AGE



February 1917

Price 20 cents

Can't a Horse Pull More Than He Can Carry

Can't a Locomotive Engine, a Tugboat and an Automobile



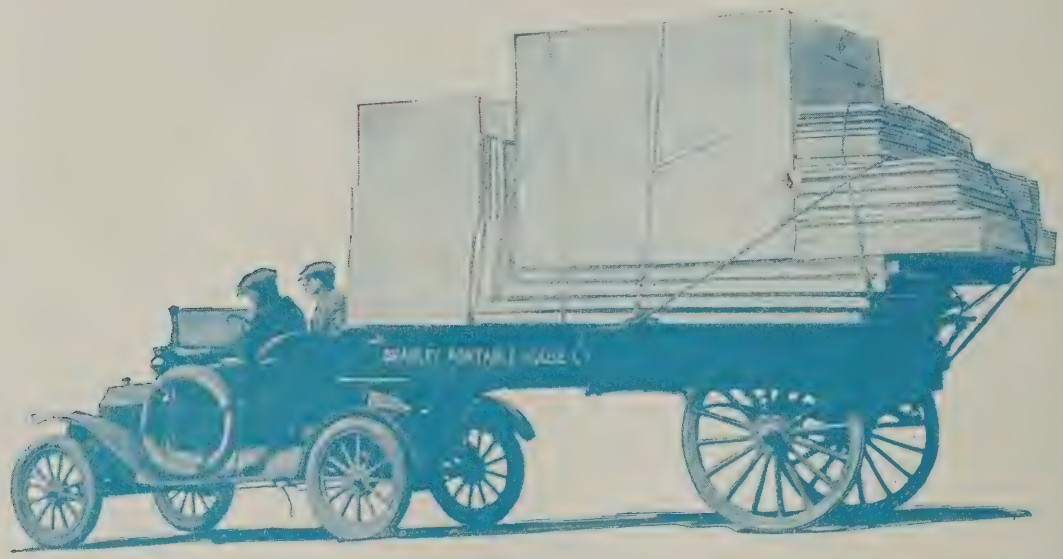
A horse can pull a ton.



He'd have hard work carrying that much.



A light roadster might carry it for awhile, but it would soon break down.



With a Martin Semi-Trailer, a Ford Can Easily Pull a Ton Without the Least Strain on the Driving Mechanism

(The reason why this is possible is fully explained in a circular which will be sent on request.)

The Martin Semi-Trailer and Ford Combination make the lowest priced one-ton truck in the entire commercial car field. It is very little longer over all than the conventional truck of the same loading space.

The Only Trailer that is 100% Efficient Because:

It can be backed, turned and handled with ease in the narrowest quarters. (Unless a trailer can be backed and manipulated in freight yards and narrow spaces it is far from being 100% efficient.)

It allows sufficient weight for traction. (Unless there is enough weight on the driving wheels for traction they will slip on the wet asphalt, ice and snow. With the Martin Semi-Trailer enough weight is carried on the driving wheels for traction.)

The Ford and Semi-Trailer combination make a unit, and is permitted on all streets and ferries. (Some cities have legislated against the use of four-wheel trailers, but in no case does this adverse legislation apply to the semi-trailer.)

The Martin Semi-Trailer was designed by automobile engineers. It is high grade in material and construction and can easily carry a ton. A Ford used as a tractor can easily draw a ton. The Rocking Fifth Wheel connects with the Semi-Trailer Ford Roadster. The connection can be made and unmade instantly. It enables the Ford to be used either as a commercial vehicle or as a pleasure car at will, since the Ford is not mutilated in any way.

It Puts Hauling Costs at—

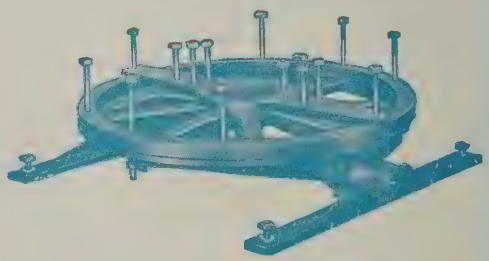


the lowest level ever known. The Fifth Wheel and Semi-Trailer together cost only

$195

Made in nine and 12-foot bodies

Contractor-Builders



Martin's Patent Rocking Fifth Wheel is made in four sizes:

Ford or Light Roadster size is 18-in. circle complete. Makes tractor-semi-trailer 1 ton capacity. Price $35.00.

24-in. circle complete, $65.00. For one and two ton trucks. Makes tractor-semi-trailer 2-4 tons capacity.

30-in. circle complete, $85.00. For two and three ton trucks. Makes tractor-semi-trailer 6-8 tons capacity.

36-in. circle complete, $118.00. For five and six ton trucks. Makes tractor-semi-trailer 10-12 tons capacity.

Send for Special Fifth Wheel Circular

MARTIN ROCKING FIFTH WHEEL CO., 242 Main Street SPRINGFIELD, MASS.

BUILDING AGE

NEW YORK, FEBRUARY, 1917



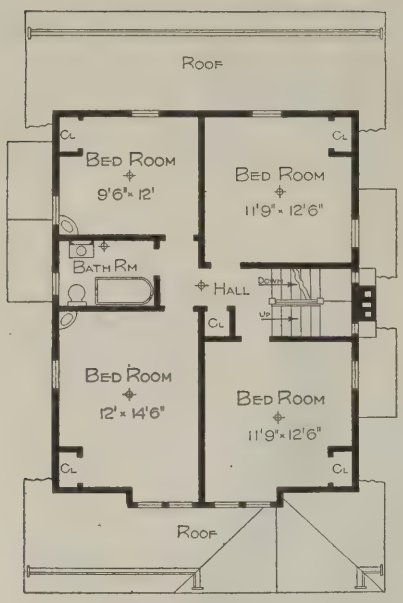
COTTAGE OF WATKINS H. DAVIES AT QUEENS, N. Y.—ARCHITECT J. L. THEO. TILLACK

A STUCCO-COATED AND SHINGLED COTTAGE

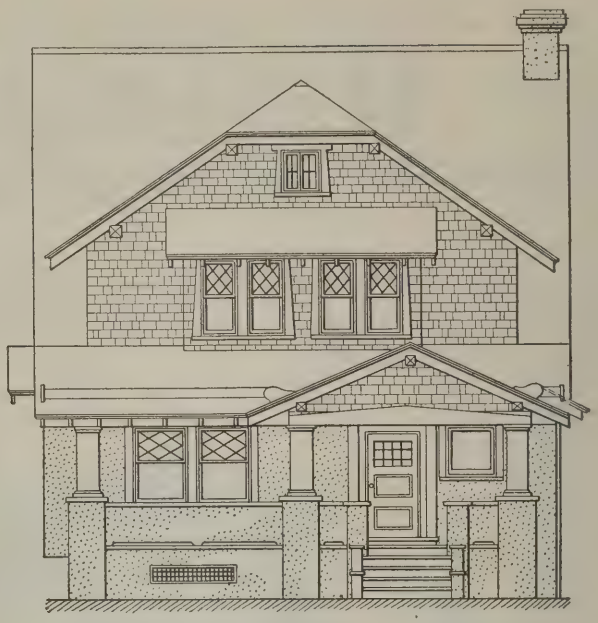
A COMPACT ARRANGEMENT COMBINED WITH ATTRACTIVE ARCHITECTURAL TREATMENT—DETAILS OF CONSTRUCTION

THE suburban cottage of modern type so rapidly growing in favor the country over, both by reason of its cozy, homelike character and the opportunity which it affords for pleasing architectural treatment at comparatively small cost, is well exemplified in the pictures and drawings presented herewith. The stucco exterior walls of the main story, the shingled gables broken with hooded windows, the outside chimney with a window piercing its lower portion, the bay window of the dining room and the porch with its massive circular columns, extending entirely across the front of the house are features which cannot fail to command the attention of interested readers.

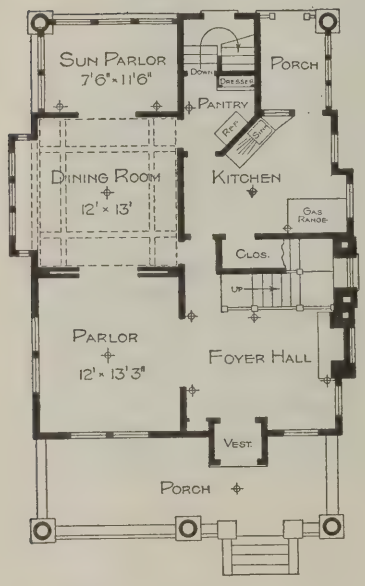
The interior is conveniently and attractively laid out. The foyer hall, with entrance from porch through the vestibule, the brick fireplace with Welsh quarried tile hearth and panelled wall around the main stairway to second floor concealing the door to the kitchen are noticeable features. The parlor and hall are thrown together with a large cased opening, giving a roomy and pleasing effect. The dining room has large bay window, beam ceiling and sun parlor separated from it by two French casement doors. There is a sliding door between dining room and parlor, insuring privacy when desired. The kitchen, convenient to the pantry and dining room, is well arranged and lighted by two



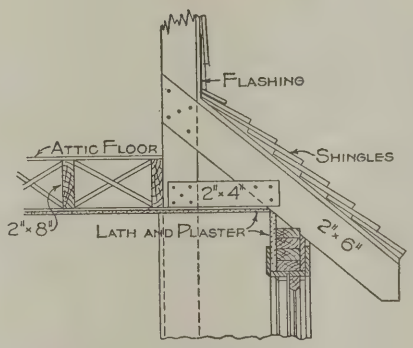
Second Floor Plan—Scale 1/16 In. to the Foot



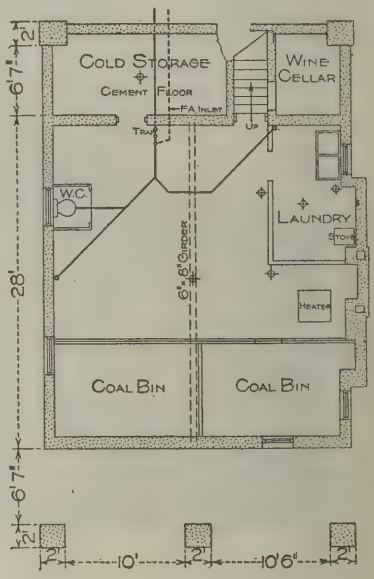
Front Elevation—Scale 3/32 In. to the Foot



First Floor Plan—Scale 1/16 In. to the Foot



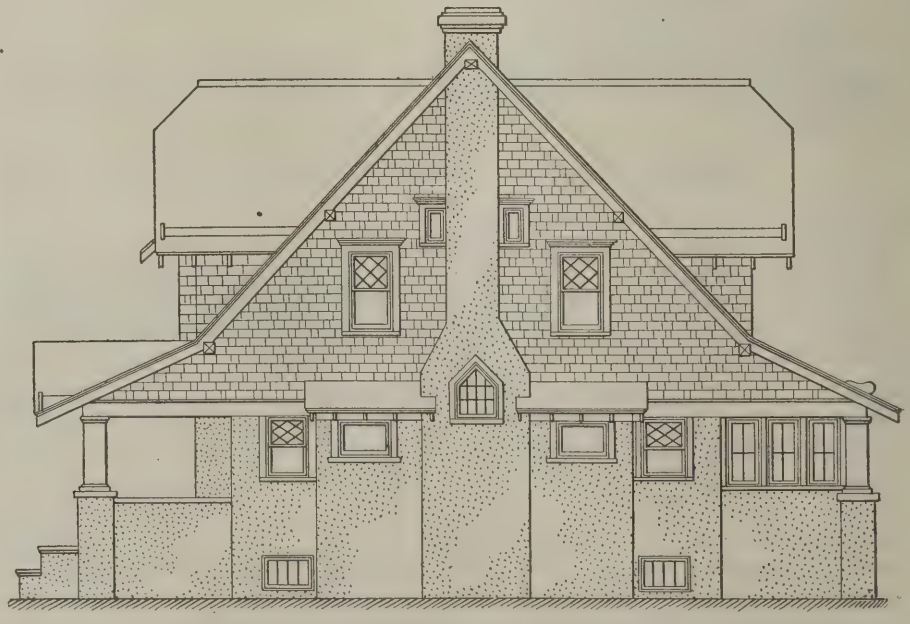
Section Through Front Gable Window Showing Construction of Hood —Scale ⅜ In. to the Foot



Foundation—Scale 1/16 In. to the Foot



Plate Rail—Scale 3 In. to the Foot



Side (Right) Elevation—Scale 3/32 In. to the Foot

windows, while the fixtures are conveniently placed.

The second floor has four large bedrooms and a bathroom, each opening into a central hall. All bedrooms have large closets. The bathroom has tile floor and sidewalls with a medicine cabinet set in the partition flush with the wall. The attic is large and roomy and contains the maid's room. The cellar, which extends under the entire house, contains a laundry, coal bins, steam heating plant, extra toilet room and cold storage space.

The foundation walls are of concrete mixed in the proportions of one part Portland cement to two parts clean, sharp sand and four parts gravel. The cellar floor is of concrete, 3 in. thick, mixed in the above proportions, with a top dressing about 1 in. thick consisting of one part cement and two parts sand. This floor is pitched to a drain underneath, consisting of a dry well filled with loose stones. The soil where this cottage was erected is sandy, thus allowing any moisture to seep through.

The outside of the foundation walls below grade were painted with one coat of No. 2 R. I. W. waterproof paint carried down to the bottom of the footings. The exterior chimney is built of common brick with raked joints for stucco finish. A covert throat damper connects the fireplace with a smoke chamber and terra cotta flue lining.

The framing timbers throughout are of well seasoned spruce, the sills and posts being 4 x 6 in., the studs 2 x 4 in., the first and second floor joists 2 x 10 in., all joists being doubled under partitions. The girder in the cellar is 6 x 8 in., supported on 3½-in. steel columns filled with concrete. The attic floor timbers are 2 x 8 in. and the roof rafters and ceiling beams are 2 x 6 in. All headers and trimmers around openings are 4 x 10 in.

The exterior framing of the house was covered with 1-in. ship-lap sheathing boards and over these for the main story was placed three-ply tar paper laid horizontally on the sheathing. This paper in turn was covered with Clinton galvanized wire lath of No. 20 gage with V-shaped stiffening ribs woven in every 7 in. tightly stretched and fastened to the sheathing boards by means of staples. To this metal lath was applied the stucco consisting of a first coat of rough mortar mixed in the proportions of one part Portland cement to two parts sand and a little well seasoned lime putty. This coat was well dampened and well scratched and before it had become thoroughly set a second coat consisting of one part Portland cement and two parts sand without lime, was put on and floated to a straight and true surface. The finish coat was applied before this had become thoroughly set and consisted of cement and sand in equal proportions thrown on with a brush so as to give a "stipple



ANOTHER VIEW OF THE COTTAGE OF WATKINS H. DAVIES AT QUEENS, NEW YORK

finish." All ingredients for the cement stucco were thoroughly mixed dry and in measured proportions, so as to insure an even color throughout.

For that portion of the exterior of the house above the stucco work one thickness of Neponset waterproof building paper was placed over the sheathing boards and well lapped at all joints. Over this in turn were laid red cedar shingles which were exposed 5½ in. to the weather and which had been dipped in creosote shingle stain.

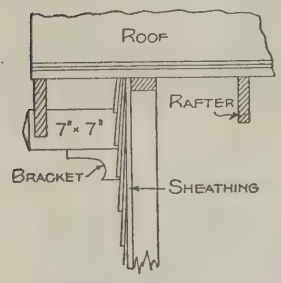
On the rafters were placed 1 x 2-in. shingle lath to receive the shingles which were exposed 5 in. to the weather and which were fastened in place with zinc-coated nails. All overhangs were laid with 1 x 6-in. matched and beaded white pine, well secured to the building and nailed on the second rafter from the face of the building, so as to render the construction perfectly rigid.

The porch floors were laid with 1¼ x 3-in. tongued and grooved cypress imbedded in white lead and resting on 2 x 8-in. spruce timbers.

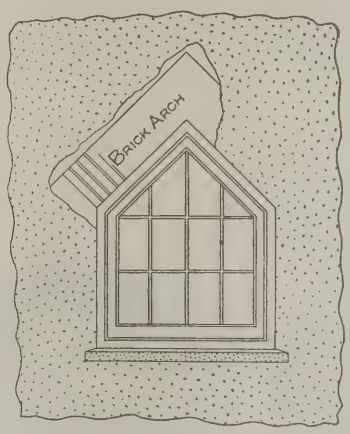
The floors throughout the house are double, the under-flooring consisting of 1 x 8-in. tongued and grooved boards with joints broken on bearings only. This flooring is fitted up tight against the outside sheathing and over it was placed one layer of building paper. On this in turn was laid the finish floor consisting of ⅞ x 2½-in. North Carolina pine laid in long lengths, well driven up and blind nailed.

All rooms throughout the cottage are plastered with three-coat patent plaster, with a hard white finish coat.

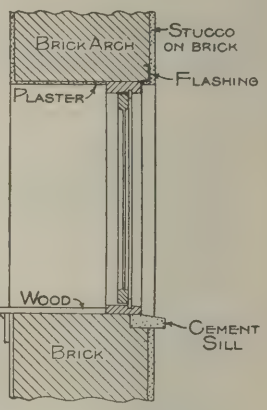
All windows have stock frames of white pine with pulley stiles and parting strips of hard pine. The



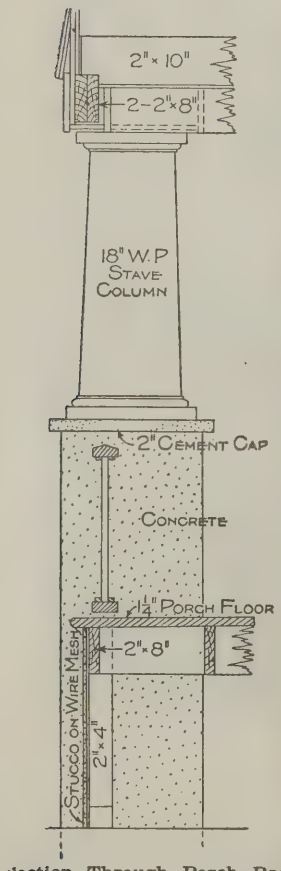
Section Through Overhang—Scale ⅜ In. to the Foot



Elevation of Window in the Outside Chimney—Scale ⅜ In. to the Foot



Vertical Section Through Window in the Chimney—Scale ⅜ In. to the Foot



Section Through Porch Rail Showing Column Construction—Scale ⅜ In. to the Foot



Side (Left) Elevation—Scale 3/32 In. to the Foot

sills are rabbeted and of 2-in. stock. All double-hung sashes are provided with Silver Lake sash cord and balance weights.

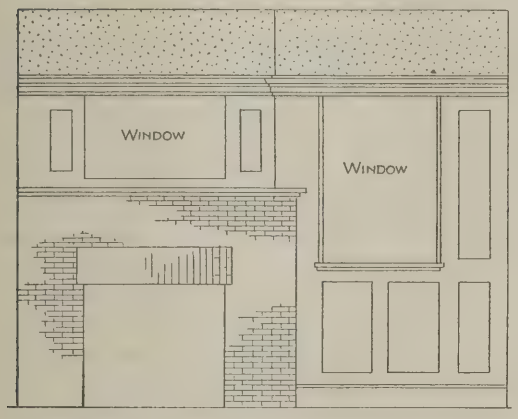
All interior doors on first floor are of chestnut of the two-panel type; the front and rear outside doors are of white pine, painted. All doors on second floor are of four cross-panel cypress, 1⅜ in. thick.

All trim on first floor is of No. 1 chestnut, stained and varnished. All trim on second floor is of No. 1 cypress, finished in white enamel, with doors finished natural.

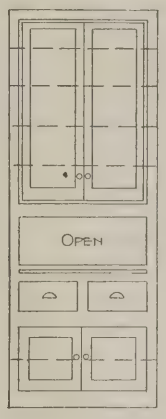
The steam heating plant has a Richardson & Boynton Co.'s boiler with cast iron radiators. All pipes in the cellar are covered with air-cell sectional asbestos covering, and the boiler is covered with asbestos cement.

The cottage here illustrated and described was erected at Queens, Long Island, New York, for Watkins H. Davies, in accordance with plans and specifications prepared by Architect J. L. Theo. Tillack, 150 Nassau Street, New York City.

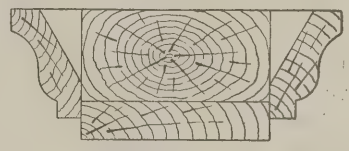
J. Mead Briggs, of 200 Broadway, New York, was the contractor who executed the work.



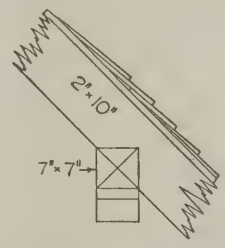
Elevation of Fireplace and Panelling in Foyer Hall—Scale ¼ In. to the Foot



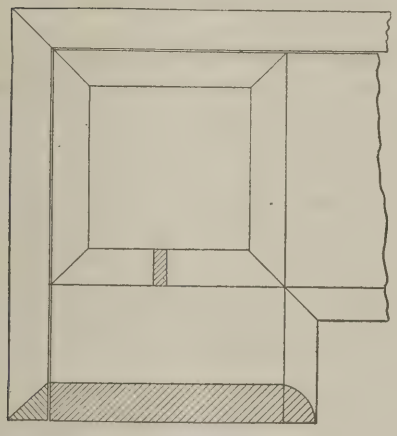
Elevation of Dresser — Scale ¼ In. to the Foot



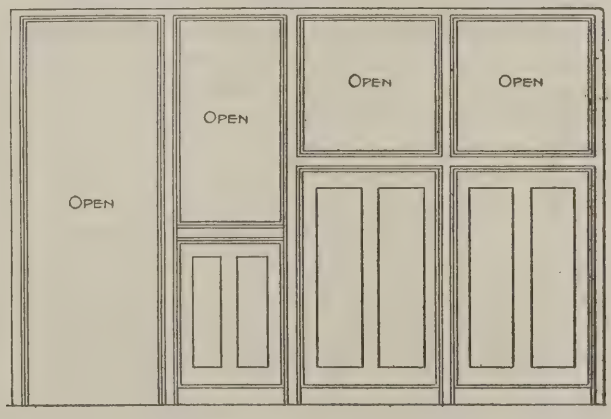
Section of Beam in Ceiling of Dining Room—Scale 3 In. to the Foot



Detail of Overhanging Rafter Showing Bracket—Scale ⅜ In. to the Foot



Detail of Interior Trim—Scale 3 In. to the Foot



Elevation of Staircase Paneling—Scale ¼ In. to the Foot

PLANS FOR HEATING SMALL BUILDINGS

Adequate heating of small houses, a problem of interest to architects, builders, and owners, may be solved, providing the engineering profession devotes time to the question, according to an article submitted to the Engineers' Club of Philadelphia by George Barr in which he says:

"The problem of heating residences of the smaller size is one which has received entirely too little attention, not only from the owner and architect, but from the engineer as well.

"Small houses, whether built singly as residences for their respective owners, or in groups or rows, as operations for the purpose of sale, should have adequate heating plants, but these must be obtained at a cost which shall not be out of proportion to the total investment in the completed house.

"When, at rare intervals, an owner or architect of such houses has heating plans prepared by an engineer he is surprised to find, on opening the bids, that the estimates are in excess of the appropriation for that item, based, sometimes at least,

on the cost of installation for buildings of similar character.

"It is with the idea of making more general the preparation of plans and specifications by the engineer for the smaller heating plant that the following suggestions are made:

"In selecting the boilers, and there should be more than one specified, due consideration should be given, not only to the grate area, direct and indirect heating surface, but to the size and height of the chimney, and the probable velocity and volume of the draft.

"In many cases, a boiler is selected by its catalog rating only, and when that method of procedure obtains, the heating contractor frequently finds that he must install a boiler with a very small amount of grate and direct surfaces, and a large amount of indirect surface, and attach it to a flue which is small in size and low in height, and which will not give sufficient draft for proper combustion. This renders the indirect surface of little or no value, or the boiler selected may have large grate area and adequate direct surface, but very little indirect surface, and attached to a large flue of considerable height which provides excellent combustion; but the boiler fails to develop its rating because there is not sufficient indirect surface to absorb the heat from the gases before they pass into the chimney.

"The selection of the wrong boiler as above indicated places a handicap on the success of the installation which it is almost impossible to overcome.

"While 'safety first' is becoming more and more popular, it has no place in determining the amount of radiation required for each room. If a heating plant is designed to warm the rooms in which radiators are placed to 70 deg. when the outside temperature is zero, that is the extreme requisite, which is encountered only a few times during the heating season, and under such conditions slightly more frequent attention to the fire is to be expected than is required in mild weather."

COLORING CONCRETE

To color concrete properly it is not advisable to use paints or stains. Best results are obtained from the use of a pure mineral cement color that is free from clay, gypsum, and organic matter.

A well-informed contractor offers, in the *Architect and Engineer*, the following formula for coloring cement. He says:

The colors will not fade if the directions are closely followed. These recipes were given me some years ago, and I find that wherever tried they have proved to be all that was expected of them. The quantities are given per barrel of cement, the coloring matter, in each instance, being mixed dry with the cement and sand. Caution is given that venetian red and common lampblack should not be used, as the color obtained with these materials will run and fade. The various colors and quantities of coloring materials for each barrel of cement are as follows:

For brown, 25 lb. of best roasted iron oxide; or 15 lb. to 20 lb. of brown ochre.

For black, 45 lb. of manganese dioxide.

For blue, 19 lb. of ultramarine.

For buff, 15 lb. of ochre. (This is likely to considerably reduce the strength of the mixture.)

For green, 23 lb. of greenish-blue ultramarine.

For gray, 2 lb. of boneblack.

For red, 22 lb. of raw iron oxide.

For bright red, 22 lb. of Pompeiian or bright vermilion.

In using coloring matter with concrete, the color should always be mixed with the cement dry, before any sand or water is added. The mixing should be thorough.

PRODUCTION OF LIME IN 1916

An estimate of lime produced and sold in 1916 in the United States, including Porto Rico and Hawaii, just made by G. F. Loughlin of the United States Geological Survey, Department of the Interior, indicates a total marketed production of 4,150,000 short tons, a gain of nearly 15 per cent over the total for 1915, which was 3,622,810 short tons. This is the first year in which production of lime in this country has equalled or exceeded 4,000,000 tons.

Of the 43 States in which lime was produced and sold, 31 reported increase. The remaining States represented less than 6 per cent of the total quantity produced. The only States with output of more than 50,000 tons that showed decrease in 1916 were Michigan, which produced 80,000 tons (a decrease of 1 per cent), and Illinois, which produced 74,000 tons (a decrease of 16 per cent). Washington, which produced 25,000 tons, showed a decrease of 8 per cent.

Hydrated lime in 1916 showed an even more striking increase than total lime, the marketed production amounting to 710,000 tons, a gain of more than 13 per cent. All States in which the production amounted to 5000 tons or more showed increase. These States included Michigan, Illinois, and Washington, in which the total production of lime decreased.

Prices of lime were generally higher in 1916 than in 1915, though in some places the increase was not great until the close of the year.

SAN FRANCISCO BUILDING SINCE THE 1906 FIRE

According to a report compiled by the San Francisco Board of Public Works, expenditures for building construction in San Francisco from May, 1906, to November, 1916, totaled $292,846,885. The list includes 211 Class A buildings.

The oldest building material is timber which was largely used, a long time before bricks, during the Neolithic stone age, when the dwellings were either caves or huts of timber erected on timber piles driven into the bottoms of lakes.

A FEW HINTS FOR THE HOME BUILDER

SOME SUGGESTIONS WHICH THE PROSPECTIVE BUILDER WILL FIND VALUABLE

By F. H. Sweet

PARTITON studs are usually 2 x 4, of one-story length, with heads and soles or their equivalent. When on line with a girder, they rest upon it. The head is a 2 x 4 spruce stick, or better, a 3 x 4 Southern pine. The head of a partition which receives the floor timbers should be set at the height of the sunk girt, so that they may be sized upon it. If the partition extends two stories or more, the head of the lower partition becomes by its position the sole of the partition above.

PARTITIONS AND FIRE STOPS

A one-story partition parallel to the floor timbers above should stand under a floor timber, to avoid sagging. To introduce a fire stop on the partition head, two beams should be straddled 4 in., with straight bridging between; the partition comes in the center, the interval above being filled with brick and mortar. A partition running parallel to the floor timbers and extending through them should have 2 in. on each side between studding and floor timbers, for nailing of finish. This space is straight bridged and the interval filled with brick and mortar.

A partition unsupported from below should be trussed. If set across the floor timbers, the sole should rest on the rough flooring; if light, the supporting floor timbers should be three, with 2-in. straight bridging between. Ordinarily, two floor timbers straddled 5½ in. apart do this work, but three are better, and four if the partition be heavy. The two middle ones should be spiked together, forming a sole, and the two outer ones straight bridged 2 in. on each side. A very heavy partition requires a truss. Partitions and outer walls should be bridged either with straight bridging, or better, by giving it a slight incline, permitting adjustment to shrinkage; even if loosened, the weight of the brick stops is sufficient to give firmness.

THE ROOF

The roof often presents most difficult problems. The pitch, or gable roof slopes like a wedge from the apex. The rafters are notched on to the plates. The common rafters should be 2 x 9 in., as smaller are not advisable. To keep rafters from "kicking out" at the bottom, tie beams are run from each to its opposite mate. These collar beams may serve as ceiling timbers for the attic rooms. In valleys, one rafter is carried to the ridge of the main roof, the other intersecting it at the required height. The valley rafter should be heavy.

The hip roof pitches four ways, in somewhat pyramidal form. The hip rafters (those coming at the corner slopes) should be heavy. This is a strong form of roof, adapted to large houses where dormers will provide light, or to small ones, where the attic will be little used.

THE GAMBREL ROOF

The artistic gambrel roof serves very practical purposes. Each side breaks into two slopes, the lower being the steeper. This gets rid of one story, yet gains much of the space that story would include. A plate is required at the intersection of the two pitches, on which rest the upper rafters; they overlap each other and are spliced. The lower rafters rest on the main plate. A short false rafter often gives a slight "kick" to the eaves. If the lower pitch is designed to give more than one story, its floor timbers are framed to it with a ledger board or its equivalent, alternate timbers being spiked to the rafters as a tie beam. It is essential that the floor timber be at right angles to the roof.

THE SHEATHING

Rough boarding, usually of spruce or hemlock, should be seven-eighths stock, planed on one side, and laid with the planed side out. It need not be matched nor laid with close edges. On the balloon frame the boarding should be diagonal, its direction changing several times on each wall; and the additional strength afforded by the diagonal boarding is desirable even in the braced frame. Roof boarding should be the same as wall boarding; diagonal boarding is best, as roofs (except hip roofs) have no strong braces. Sometimes the roof is covered with horizontal strips, spaced to receive the shingle nailings. This is a poor method for any but light-built structures. The under-floor layer should be of matched hemlock, of even thickness, laid closely and diagonally, to break joints with the floor itself, though ordinarilly it is laid at right angles to the floor timbers (in parquet floors, the upper floors must run at right angles). A single floor is noisy, dirty, full of cracks and drafty.

Brick walls are simple of construction. In vaulted walls (outside walls only), an air space, usually two inches, is left, extending from the bottom to the top, the wall being cross-tied, the floor timbers solidly filled about. The air space keeps moisture from penetrating the inner shell, and can serve as a ventilating flue. Outside walls should be no less than 12 in. or 14 in. thick; more for the lower of two-story walls. An interior wall should be 12 in. thick for the first and second stories and the cellar support should be 16 in. thick. An eight-inch wall is

not safe under much weight, but may be used in the attic or small partitions. When floor timbers are set in a brick wall, the bearing is four inches, and the bottoms are sized. The ends are cut away four inches at the top to nothing at the bottom; in case of fire, the falling timbers will not pry the walls over. Leave air space around the ends. At intervals of not more than eight feet, the floor timber should be anchored to the wall. This anchorage should continue from side to side of the building. The anchor irons are half-inch flat bands, one and one-half inches wide and four feet long, turned up four inches at one end. The turn-up is built into the wall back of the outside face, and the bar spiked to the beam.

THE STONE HOUSE

The stone house is built with a stone facing, backed with rough stone or brick, the whole bonded and tied with anchor irons. The latter should be galvanized, of one-twelfth inch metal, and are turned up at the ends in opposite directions, one end being rounded for insertion into the stone. In a wall of rough field-stone, the wall is often laid without lining, the studding resting against the stone, with brick fire stops provided. In stone or brick walls, the plate is bolted to the wall.

Wood laths are four feet long. They should be three-eighths of an inch apart; and if every lath breaks joint, the job is better. Above openings, the laths should extend to studs beyond the jamb. Plastering should be quite to the floor.

Two-coat work is good, yet three-coat work is better. In both, a scratch coat is first applied. It is forced through the lathing to insure a good clinch on the back. The surface is then scratched with a comb to make an adhesive surface. In two-coat work, the skim coat now follows, but in three-coat jobs the second, or brown coat, is applied. Plaster applied to a brick wall does not make a good job. Should it be required, however, the first rough coat is best omitted. One rough coat is applied inside the rough boarding of a frame house to exclude cold and heat. The lathing must be cut between the studs, and should be furred off from the boarding. Furring laths may be set out from the corners about a half-inch, giving a chance for the plaster to pass through and clinch well in the corners.

THE LEADING PROBLEMS

It is, of course, impossible to present in limited space all the details of construction that will confront the man who supervises the building of his own house. Unforseen problems will continually arise, and these can be solved only when they reveal themselves. Nevertheless, the leading problems that the builder will encounter are those explained in this article. Selecting good ground; sinking the foundation trench deep enough and laying a strong foundation; bracing the frame strongly, and, with the balloon frame, exercising special care to secure strength; making the inside framework strong, and raising it in such a way as to escape sagging; joining the roof securely, and making it an artistic capping-off of a well-designed structure. By constant care of these details the builder of a country house will erect a strong and well-made building, and one of which he may feel proud.

BUILDING A CONCRETE CELLAR ABOVE GROUND

In many sections of the country the builder is often called upon to construct a vegetable cellar above ground—one that will prevent the contents of the cellar from freezing and at the same time will keep out the heat in summer. A cellar of this nature was completed some time ago by a correspondent in Missouri and the following particulars regarding the construction may not be without interest to our readers.

In the first place, a cellar 12 ft. in diameter and with walls 10 ft. high and 4 in. thick was built and covered with a 3-in. concrete slab roof. Next, another cellar was built outside of this, large enough to give a 20-in. air-space all around between walls and roofs. At the doorway a screen door was provided to open inside and a three-ply wooden door to open outside. In doing the work two sizes of silo forms were used.

The floor is of concrete with drain pipe from the center to take care of any water that might accumulate on the floor. There is also an 18-in. concrete shelf all around the inside and molded to the wall. A concrete basin is provided which will hold about 30 gal. of water, this being filled with water from the well and into it is put milk and butter to keep cool.

AN ELABORATE FLOOR CONSTRUCTION

A concern making engines, which is building a new plant on the Oakland, Cal., water front, is going to considerable expense to secure what is considered the best type of floor construction, the theory of the management being that on the right kind of floor the employees can work to much better advantage, and that this factor has an important bearing on the health and the disposition of the workmen.

A substantial concrete sub-floor is laid on the ground under all the buildings, making them proof against rats and other vermin, as well as excessive dampness, and giving a solid foundation for the machinery. Upon this 4 x 4 in. redwood beams are laid at 6 in. intervals, covered by a rough flooring of 2 in. Oregon pine planking. The finish floor is of 1 x 6 in. Port Orford cedar, laid diagonally. It is held that this form of floor is certain to be dry and reasonably warm, with a certain resilience which is lacking in such inert materials as concrete or asphalt, and little tendency to become either slippery or excessively rough.

A building show is planned to be held in Milwaukee, Wis., from April 9 to 15, under the auspices of the Milwaukee Real Estate Association, which will include all building products.

A MODEL SUBURBAN FIRE ENGINE HOUSE

DESIGN FOR AN EXCLUSIVE RESIDENTIAL DISTRICT AND EMBODYING MANY INTERESTING FEATURES

THE pressing need of suburban fire stations is felt in every community, but in many cases the owners of houses in exclusive residential districts often prefer to take the risk of fire rather than have their attractive home sections marred by the usual city fire houses as designed by municipal officials. The building which forms the basis of the present article, however, is a striking example of what can be done in the way of providing a suburban fire house of such architectural treatment as to be in keeping with the dwellings composing the exclusive residential section of the city in which it is located. In carrying out the ideas of the property owners it was necessary to make the building not only useful but ornamental as well, and the extent to which the architect has succeeded in accomplishing this result may be gained from an inspection of the half-tone engraving, which represents a picture of the completed structure.



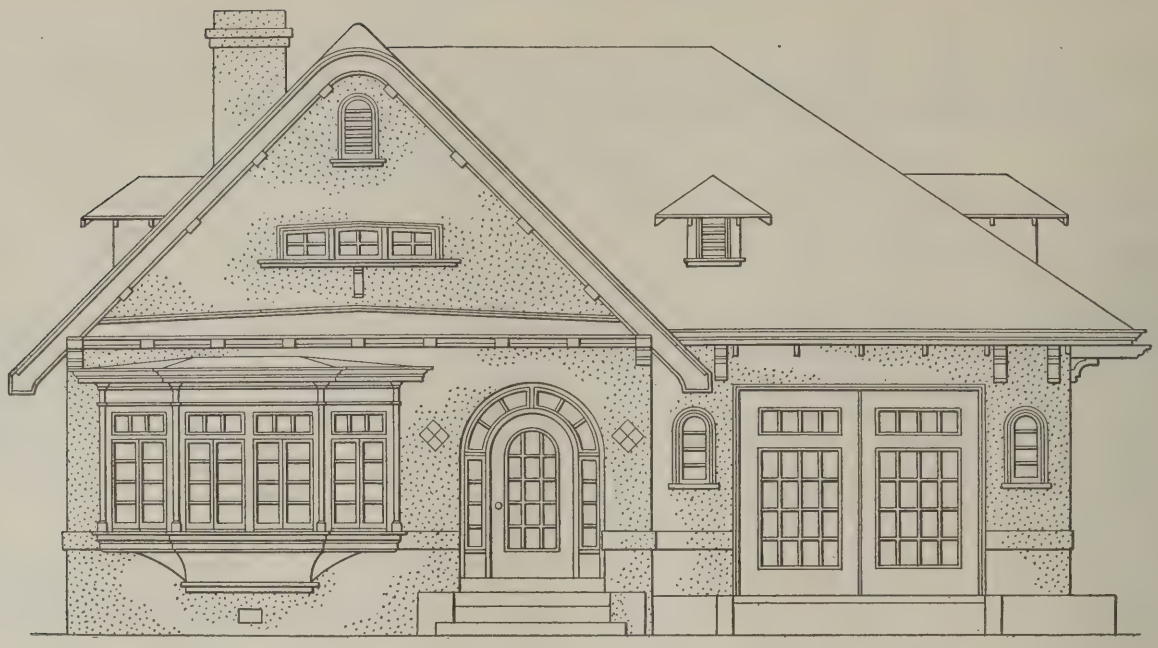
GENERAL VIEW OF THE MODEL SUBURBAN FIRE ENGINE HOUSE—ARCHITECT JAMES A. McCULLOUGH, SACRAMENTO, CAL.

The foundation footings and the base for the sidewalks and floors are of concrete composed of one part cement, three parts river sand, and six parts small broken stone. The top coat to sidewalks and floors consists of a mixture made up of one part cement to one and a half parts clean sharp top gravel, with enough coloring pigment to give the proper effect. The top coating was spread evenly to a depth of ¾ in., then troweled to a true polished surface and finally blocked off into squares of a given size.

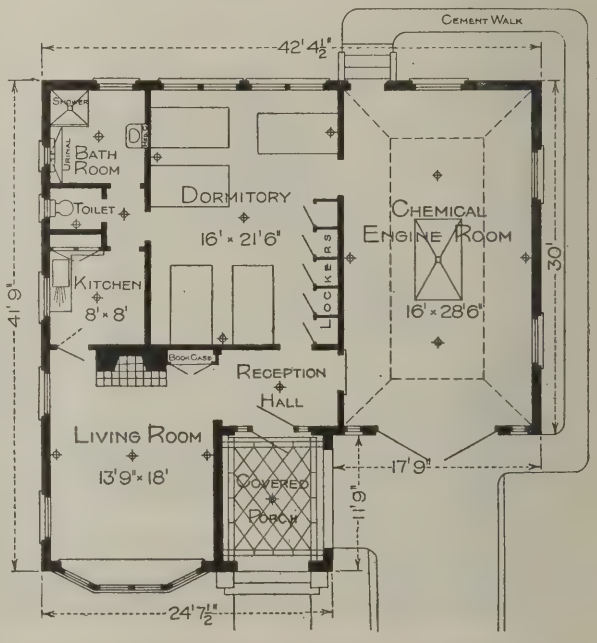
The exterior walls of the building all around, from the foundation slab to the bottom of the ceiling joists in the living quarters, and to the spring line of the ceiling around the engine room, are 8 in. thick, constructed of California Denison interlocking tile laid up with ½-in. thick mortar joints. The mortar was mixed in the proportions of half a sack of cement to each barrel of lime mortar.

The arches over all openings were made of tile reinforced with steel rods properly embedded in reinforced concrete. All openings wider than 7 ft. were spanned with reinforced-concrete girders.

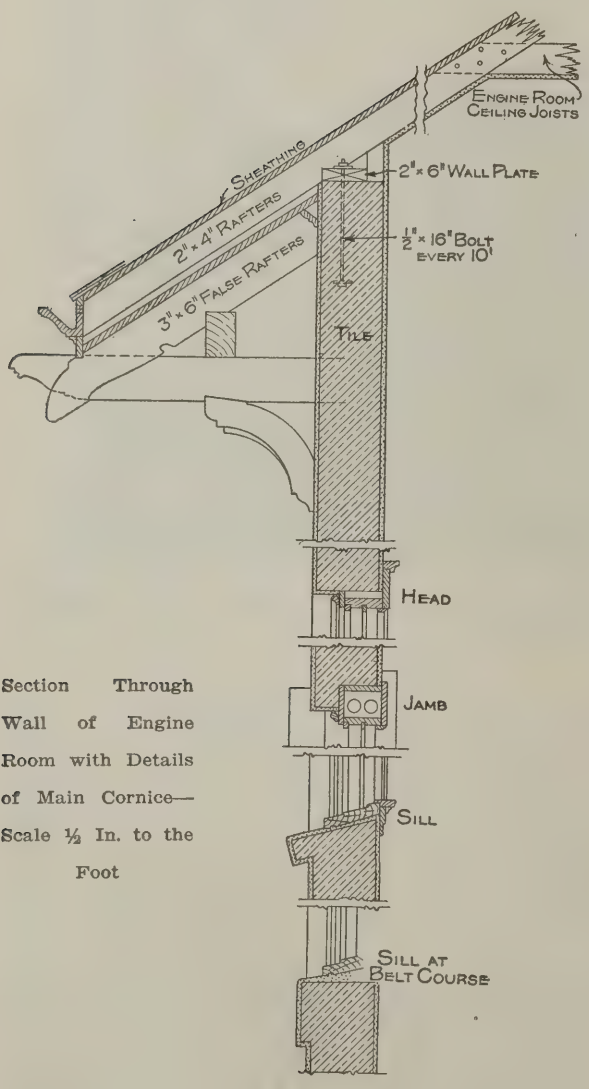
The framing lumber is of pine and the flooring is of best quality No. 1 material. The floor joists are 2 x 10-in. Oregon pine sized, placed 16 in. on centers, and every fourth joist anchored to the tile wall. All bearing partitions are of 2 x 4-in. sized Oregon pine studs, placed 16 in. on centers, with double plates at the top and single plates at the bottom. The interior partitions are made of 2 x 3-in. sized Oregon pine studs, also placed 16 in. on centers, with single plate at top and bottom. Where metal lath is used, the studs are placed 12 in. on centers. The ceiling joists are of rough 2 x 4-in. Oregon pine, placed 16 in. on centers, well spiked to the partitions, and every fourth joist is tied into the walls.



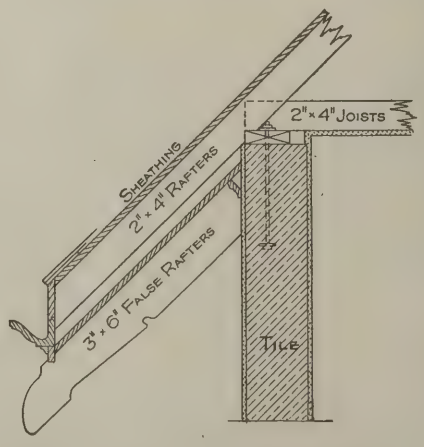
Front Elevation of the Suburban Fire Engine House—Scale ⅛ In. to the Foot



Main Floor Plan—Scale 1/16 In. to the Foot



Section Through Wall of Engine Room with Details of Main Cornice—Scale ½ In. to the Foot



Section Through Wall and Overhang of Main Roof—Scale ½ In. to the Foot

The rafters are of 2 x 4-in. rough Oregon pine, placed 32 in. on centers. On top of the tile walls is bolted a 2 x 6-in. Oregon pine wall plate, which is set flush with the face of the plaster of the outside of the wall.

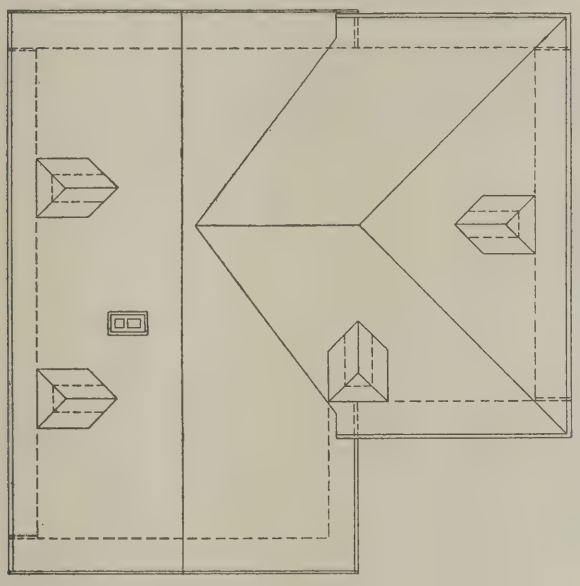
The girders running through the basement are of 4 x 6-in. Oregon pine set on top of 4 x 4-in. Oregon pine posts, which rest upon blocks embedded on top of the basement piers.

All partitions are stiffened with a row of herringbone bridging except where they are wainscoted. The wainscot bridging is placed horizontal, and all bridging is the same width as the studding in which it is placed.

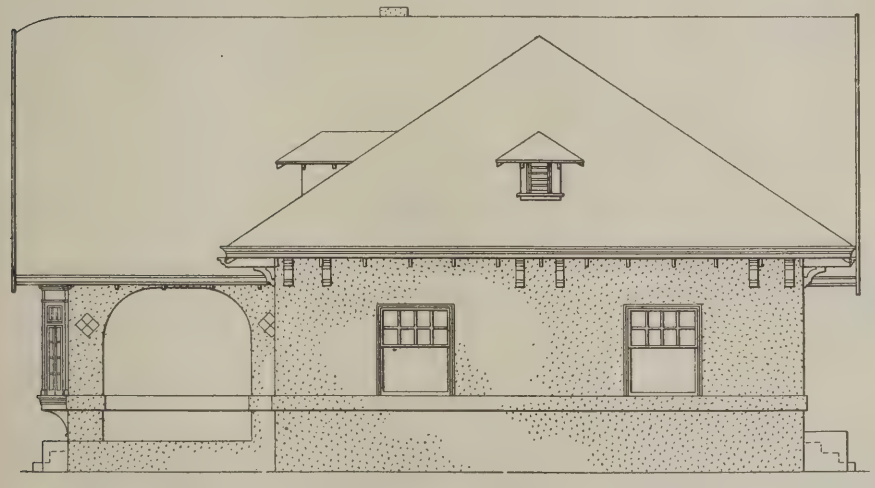
The exterior walls are plastered with a mixture consisting of one part cement to one and a half parts sand, the plaster being two-coat work ½ in. thick, and finished in a first-class manner. The gables in both ends of the building, as well as the dormers in the roof, are covered with three coats of cement plaster applied to galvanized-metal lath, the finish corresponding with that of the tile work.

The roof boards are 1 x 6-in. Oregon pine, laid 9 in. on centers, and these are covered with No. 1 redwood shingles exposed 4½ in. to the weather, every fifth course being doubled in order to give the effect shown in the picture. The shingles were given two heavy coats of stain of selected color. The ridges and hips are shingled and the valleys are made up of tight shingles.

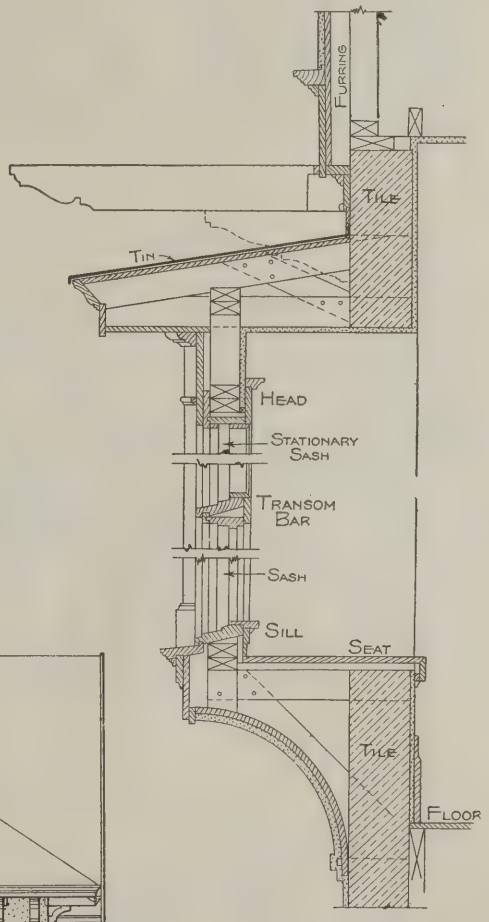
The covering of all eaves is 1 x 4-in. tongued and grooved V-joint Oregon pine. All the surfaced lumber, such as mock rafters, exposed beams, verge boards, and other work, is of surfaced redwood. The rear and front steps are of cement.



Outline Roof Plan—Scale 1/16 In. to the Foot



Side (Right) Elevation—Scale 3/32 In. to the Foot



Section Through Bay Window in Living Room Showing System of Construction—Scale ½ In. to the Foot

The flooring is of No. 1 vertical-grain tongued and grooved 1 x 4-in. Oregon pine, and all butt joints are top nailed with 6d.-finish nails. All flooring is blind nailed with 8d. nails, the butt joints occurring over joists only.

Exterior window and door frames have redwood casings and Oregon pine pulley stiles with rabbeted jambs. The sash are of sugar pine and glazed with 16-oz. glass for the small lights and 21-oz. glass for the large lights.

The doors are of Oregon pine, of the one-panel

type, 7 ft. high and 1¾ in. thick. The front doors are of Oregon pine, glazed with plate glass with wood bars. All inside finish is of kiln-dried Oregon pine, hand-smoothed.

The living room and reception hall have a wood cornice and 12-in. base. The mantel has a wooden shelf, and the book case is glazed with 21-oz. glass.

The living-room chimney is of red brick, laid up with a rich cement mortar with struck joints. There are two flues, one opening into the kitchen with a 6-in. thimble, and the other is an 8 x 16-in. flue for the fireplace. Both flues are lined with terra-cotta flue lining. The top of the chimney showing above the roof is plastered outside with the same colored plaster as that of the building.

The mantel in the living room is of 8 x 8-in. fire tile, selected for mantel work. The hearth and fire-box are made of the same kind of material.

partition in the shower room extends entirely to the ceiling, and is made with four steel angle-iron studs securely fastened to the floor and ceiling. Both sides of these steel angles are covered with galvanized-metal lath and plastered with Keene's cement, blocked off to represent tile, the same as the rest of the bathroom.

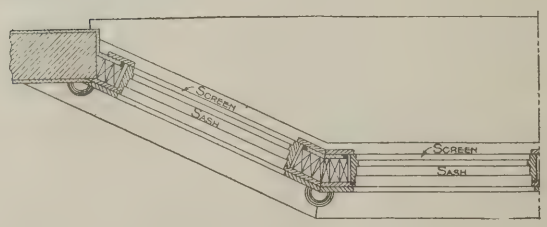
The bathroom is also fitted with a white enameled trough urinal 3 ft. long, properly vented and trapped with cement safe in the floor.

The toilet is separated from the bathroom, and is equipped with a low-down patent closet with enameled earthenware tank and wood seat. All fixtures are properly trapped and vented, and connect with sewer leading to cesspools. A ¾-in. water pipe line runs to the building, and all fixtures are connected with ¾-in. branches.

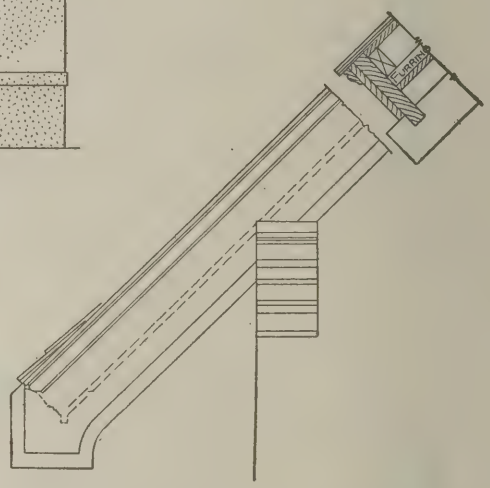
The hot-water supply is furnished by a cottage-



Rear Elevation of the Building—Scale 3/32 In. to the Foot



Half Plan of Bay Window—Scale ⅜ In. to the Foot



Details of Gable Cornice and Barge Board —Scale ½ In. to the Foot

The kitchen is wainscoted 4 ft. high with 1 x 4-in. tongued and grooved V-joint wainscoting, with cap. It is provided with a 20 x 30-in. white enamel sink, supplied with hot and cold water through Fuller bibbs.

In the dormitory are five lockers, built of Oregon pine and well ventilated. A detail of these appears upon another page.

In the bathroom is a medicine cabinet with four adjustable shelves and with plain plate-glass mirror in the door. The equipment also includes a white-enameled lavatory, with hot and cold water supply through nickel-plated bibbs, and in the rear corner, at the left of the window, is a shower bath provided with nickel-plated valves, etc. The par-

size automatic Ruud hot-water heater made by the Ruud Manufacturing Co. of Pittsburgh, Pa.

There are five ¾-in. hose outlets on the outside of the building and one ¾-in. hose outlet in the chemical-engine room.

The interior woodwork was filled, stained, given two coats of varnish, and finally a coat of Flatine, except in the kitchen, bathroom, rear hall and toilet room, which are finished in white enamel. All the walls and ceilings of the living room, reception hall and dormitory were sized and tinted in colors. All the plaster walls and ceilings of the kitchen, hall, toilet, bathroom and engine room were given two heavy coats of paint with stipple finish. The imitation tiling and woodwork in the kitchen, toilet,

hall and bathroom were given three heavy coats of white lead and oil and two coats of white enamel. All the tin and galvanized-iron work was given a heavy coat of Prince's metallic paint on the underside and two heavy coats on the upper side.

The building is wired for incandescent lighting and electric bells, all work being done strictly according to the rules and regulations of the Board of Electricity. In the kitchen is an electric bell operated by push button in the front door casing.

The walls and ceilings of all rooms, except where wainscoted, were lathed and plastered. The plastering on the tile walls was applied directly to the tile without any furring or lathing. All the lath and the inside of the exterior walls were covered with a heavy coat of Empire hard wall plaster, put on according to the manufacturer's specifications, and the second coat was of sand finish in all places except the kitchen, hall, toilet and bathroom, which were coated with Empire plaster.

The walls of the bathroom and toilet for a distance of 5 ft. in height were covered with galvanized-metal lath on wood studs, and to this was applied a scratch coat of hard wall plaster and then a second coat of cement plaster finished with Keene's cement, which was blocked off into rectangles 6 x 6 in. high to imitate tiling.

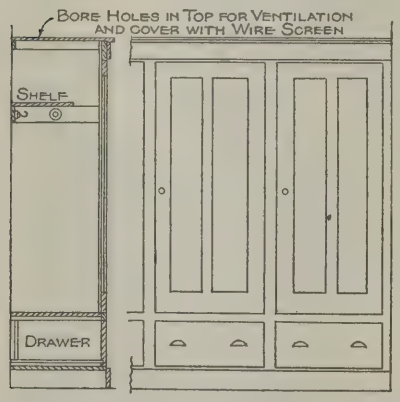
The side walls of the chemical-engine room, to a height of 5 ft., are covered with cement plaster ½ in. thick. Where the wainscoting joins the floor a cove is formed of about 2 in. radius. The corners of the room also have a cove of 2 in. radius extending the height of the wainscoting. The top of this wainscoting, entirely around the room, has a cement cap 4 in. wide projecting about ½ in.

The floor of the chemical-engine room was filled in solid with sand up to the grade line before the concrete floor was laid, this having been thoroughly wet down and very carefully tamped so as to give a firm foundation. The floor is built on an incline until it strikes the natural grade, and is then carried to the grade line of the street.

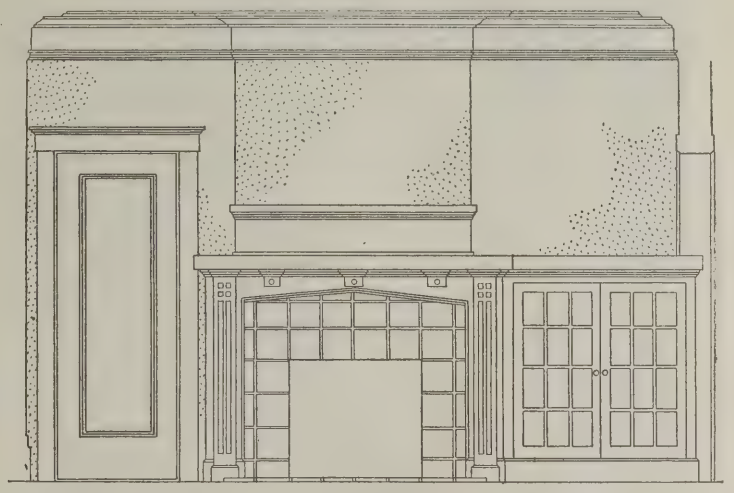
The sewer from the house to the double cesspool is made of vitrified ironstone pipe of 4 in. diameter, laid with a fall of at least ¼ in. to the foot. The discharge pipes for rain water from the roof are of the same material, but of 3 in. diameter, and made to discharge to the gutter in the street. The cesspools are constructed in accordance with the specifications called for by the Board of Health of the city of Sacramento.

The strips along the sidewalks are made of 2 x 4 in. Oregon pine, sized to give a uniform depth of 3 in. for the bottom and ¾ in. for the top coat.

This one-story tile chemical-engine house is located in what is known as the Wright and Kimbrough subdivision in the city of Sacramento, Cal., and was built in accordance with plans prepared by Architect James A. McCullough, 1108 Yardley Avenue, Sacramento, Cal.



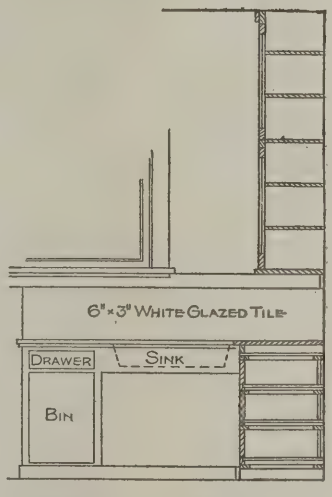
Section and Elevation of Lockers in Dormitory—Scale ¼ In. to the Foot



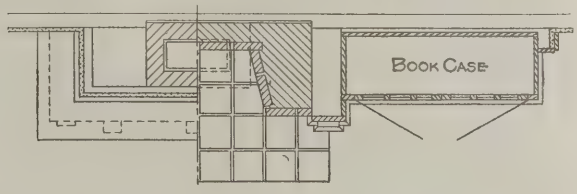
Elevation of Rear Wall of Living Room—Scale ¼ In. to the Foot



Elevation of Kitchen Case with Section Through Flour Bin—Scale ¼ In. to the Foot



Elevation of Kitchen Sink and Flour Bin with Section Through Case—Scale ¼ In. to the Foot



Half Plan of Fireplace and Bookcase—Scale ¼ In. to the Foot

ENTRANCE DETAIL OF A STUCCO HOUSE

A COMBINATION OF MATERIALS SO HANDLED AS TO PRODUCE A PLEASING ARCHITECTURAL EFFECT

THE entrance detail of a stucco-coated house presented herewith embodies a combination of building materials so handled as to produce very pleasing effects and at the same time prove of suggestive value to the progressive builder. As an all around good example of modern building it is to be much commended and as a simple, straightforward exponent of good architectural design, it will bear careful study.



DETAIL OF ATTRACTIVE ENTRANCE TO A STUCCO-COATED DWELLING HOUSE

The hood over the entrance is so simple in its construction as to need little explanation, nor do the battened shutters require extended description. Their proportions, however, should be carefully studied as it is in that feature that they are most excellent. The seats at either side of the doorway, rest on a slab of cement and, as will be noted, are not built-in, but may be removed and housed for their better protection during the winter months.

The wall surface has been well treated and is just sufficiently "rough cast" in texture to throw diffused shadows that break the monotony of the expanse.

ARCHITECTS, BUILDERS AND THE LAW

ABSTRACT OF COURT DECISIONS ON RIGHTS AND LIABILITIES CREATED BY BUILDING CONTRACTS

BY A. L. H. STREET

FROM the numerous Appelate Court decisions which have been handed down within the last few months in cases in which architects and builders have been parties, I have prepared the following abstract as covering those which should hold the largest general interest for members of the building trades.

The importance of definiteness in contract provisions is illustrated by a holding of the Washington Supreme Court to the effect that a contract whereby an architect was to be given the privilege of drawing plans and superintending the construction of a building for the defendants, if at any time in the future the defendants should desire to erect a building, was too uncertain in its terms to sustain an action for damages on the theory of a breach of the agreement. Claiming that he had been damaged in the sum of $600 through defendants' breach of the contract in the employment of another architect in connection with the construction of a building at a cost of at least $12,000, plaintiff sued defendants. In affirming a judgment which had the effect of dismissing the suit, the Supreme Court said:

"This contract has too many uncertainties, which neither time nor any other contingency can supply, save the making of a new contract between the parties. It fails to state on what terms the employment is to be entered upon, whether appellant or respondent is to name the terms and conditions, or whether they are to be determined mutually. * * * The courts can supply some elements in a contract, but they can not make one; and when the language in a contract is too uncertain to gather from it what the parties intend, the courts cannot enforce it."

PLANS FOR PUBLIC BULIDINGS

Because plans and specifications for a municipal building to be constructed in Brooklyn involved an estimated cost largely in excess of funds appropriated for the structure, a firm of New York architects were denied right to recover for the services, in a decision handed down by the Appellate Division of the New York Supreme Court. The contract contained a clause to the effect that the total estimated cost should be "well within the total appropriation." The only appropriation in existence was one for $500,000. The plans prepared under the contract involved a cost exceeding $3,000,000.

It was urged on the part of plaintiffs, in their suit to recover compensation for their services, that a public building for the purpose that the one in question was to be used, could not have been built for the sum appropriated, and that therefore the parties were justified in believing that further sums would be appropriated, but the Appellate Division declares that "the difficulty with this argument is that we are required to prophesy the future action of the board of estimate, or to exclude entirely the words referring to the appropriation. The contract may have been a foolish one for the parties to have made. We, however, are not required to make another for them, but to interpret the contract they have made according to the language used by them."

In adjudging liability of a firm of architects for damages resulting from collapse of the roof of a school building, they having furnished the plans therefor and superintended the construction, it was decided by the Supreme Court of Washington that the architects should have anticipated that a depth of 9 in. of snow might rest upon the roof at times; and that if the roof was not sufficiently strong to carry the weight of snow which reasonably might have been foreseen, the measure of damages recoverable by the school district was the amount of loss actually sustained. It was said to be the achitets' duty to furnish plans for and secure construction of a building whih would meet the conditions expected of it.

The fact that a building contractor has failed to complete a construction contract is held by the Appellate Division of the Supreme Court not to affect his right to recover for extra work performed and materials furnished at the request of the owner as a transaction independent of the principal contract. In the same opinion the court declares that the measure of damages recoverable against a contractor for failure to complete his contract is the difference between the contract price and the actual cost to the owner of completing the work agreed to be performed.

STATUS OF PLANS AND SPECIFICATIONS

In litigation between a builder and an owner wherein the latter claimed that certain concrete construction work had not been performed according to agreement, it was held by the Pennsylvania Supreme Court that the trial judge properly excluded from evidence plans and specifications offered by the owner, it appearing that the specifications were not referred to in the contract. As to the plans, the Supreme Court said:

"Nor is there any merit in the suggestion that the trial court erred in rejecting defendant's offer to prove the meaning of the word 'plans' as used in this connection. The distinction between the use of plans, and of specifications, was pointed out in Knelly vs. Howarth, 208 Pa. 487, 57 Atl. 957. It was there suggested that plans are not, in the same sense, nor to the same extent, to be considered an integral part of the contract as are the specifications. Their office is rather to illustrate and explain what is to be done. In the present case the offer to show that the word 'plans' included the specifications was without any sufficient basis, and was not justified, and it was properly excluded."

The question as to when a general contractor is liable for injury sustained to a workman on a build-

ing through negligence of a subcontractor was before the Appellate Term of the New York Supreme Court in the case of Brennan vs. George L. Walker Company, where a plasterer employed by a subcontractor was injured through fall of a ceiling constructed by another subcontractor. The court laid down this general rule:

Ordinarily a general contractor, who sublets part of the work of construction on a building, relinquishing the right of control and direction over the work so sublet, and exercising only such general superintendence as is necessary to see that the subcontractor duly performs his contract, is not liable for any merely negligent acts of the subcontractor, and mere knowledge that the work is being done in a negligent manner by the subcontractor is not sufficient to charge the general contractor therewith, unless he actually participates in and exercises control and direction ove rthe manner in which the work is done. If, however, the work is done not merely in a negligent manner, but in violation of law, an dthe general contractor has knowledge of the violation of the law during the progress of the work, makes no objection, and does nothing to endeavor to cause the work to be performed in a lawful manner, he is liable, with the subcontractor, for injuries resulting from such violation of law.

CONVENTION OF MINNESOTA BUILDERS

RELATION BETWEEN PRINCIPAL BIDDERS AND SUB-BIDDERS—NECESSITY OF INFLUENCING LEGISLATION

A LARGE number of the members of the Minnesota State Association of Builders Exchanges gathered in St. Paul on Dec. 13 for the annual convention, which was held in the rooms of The Builders Exchange of that city.

The opening address of President Olson of Stillwater touched upon the success which the association has enjoyed in furthering the mutual interests of its members and the steady growth of the membership to the present total of 697. The campaign for new members was said to be up to expectations, and a new Builders Exchange, a member of the State association, has lately been formed at Mankato, the name of practically every contractor there being on the roster.

The numerous bills which are to be introduced at the next session of the State legislature called forth a word of warning from President Olson, for many of these, he stated, are likely to prove detrimental to the interests of builders, supply dealers, and the best interests of the general public. He therefore deemed it advisable for the association to oppose those bills calculated to work harm. He advocated the desirability of a Uniform State Building Code and advised the formation of a committee which should investigate what has been done along this line in various States. As the supply of competent mechanics is growing less, he suggested that means be considered to remedy this condition, and that the number of apprentices be increased if possible.

A consideration of one-cent letter postage followed President Olson's address, and the matter was referred to the proper committee, which formulated a resolution which was finally adopted in favor of equitable postal rates so that each class of mail should pay only its own cost of delivery.

At noon the delegates were guests of the Builders Exchange of St. Paul, and a number of interesting speeches were made on the subject of co-operation, including those by Toastmaster John A. Seeger and James Manahan. President Olson, among other things, said that there is no trade or business in which co-operation is so difficult as in the contracting business. A great deal, however, can be done to overcome the difficulties confronting a contractor and solve some of the questions by co-operation.

"It is said that nine-tenths of the contracts which are let are awarded because some contractor has made a mistake. The man who makes the biggest mistake is the man who gets the contract." He therefore suggested the advisability of evolving some sort of back-checking system so that mistakes in estimating might be discovered before working harm.

A. W. Lindgren of Duluth made some pertinent comments along the same lines, pointing out that the trouble which confronts many in the building lines arises from the fact that they do not know the cost of doing business. It is all a matter of education he said. "Improve the methods of estimating so that each contractor will get adequate returns for his work. The problem is largely individual, and is one which each contractor must in all probability solve for himself."

The afternoon session was devoted to various matters, including the election of officers for the ensuing year as follows:

President—N. W. Nelson, Minneapolis.
First Vice-Pres.—A. P. Cameron, St. Paul.
Second Vice-Pres.—A. W. Lindgren, Duluth.
Third Vice-Pres.—J. B. Nelson, Mankato.
Fourth Vice-Pres.—W. S. Kingsley, Faribault.
Fifth Vice-Pres.—John Lauretzen, Fergus Falls.
Sec. and Treas.—Eugene Young, Minneapolis.

One of the interesting topics discussed was the relations between principal bidders and sub-bidders, and as a result the convention adopted a Code of Practice for the members which provides that the general contractor award subcontracts to the lowest invited bidder. A committee is to report upon the question of bidders being recompensed by owners for the expense entailed in submitting a bid.

Preliminary steps were taken looking toward the organization of a Master Builders Association, and Retiring President Olson was made chairman of a committee to formulate a plan of organization, membership in the State Association being obligatory.

The Building Trades Employers' Association of San Jose, Cal., has drawn up a proposed building ordinance, covering the subject in full detail, which has been placed before the city authorities with a request for action.

CONSTRUCTION OF A CONCRETE GARAGE

THE "FORMS"—PROPORTIONS OF CONCRETE TO BE USED—THE MIXING AND PLACING

By H. Colin Campbell

NO other problem that confronts the modern home builder deserves more careful thought in solution than does the building of a garage. Here is a structure relatively cheap in itself which oftentimes contains property more valuable than the entire contents of the residence; and owing to the storage of oils, grease and gasoline that are a necessary part of the stock of supplies kept for operation, the property in question is perpetually exposed to the danger of destruction from fire. These inflammable oils and the explosive gasoline are a menace of fire not only in the garage, but likewise to the nearby residence usually on the same lot.

Concrete construction in any field means permanence, but permanence in construction is perhaps of greater value to the man of limited means because the drains of maintenance and repair are eliminated in concrete construction. Furthermore, conditions are such in the building material lines at the present time that concrete structures properly designed need cost no more than those of less durable and quite impermanent materials.

Arrangements should be made when planning a garage to extend the house-heating system, thus automatically eliminating the greater portion of fire risk. A little thought will suggest several other conveniences or working facilities that will increase the utility of the finished structure. One of these consists of a repair pit which may be 4 ft. deep, 4 ft. or 5 ft. long, and, say, 3 ft. wide. Cars can then be run over this, affording a mechanic greater ease in examining or repairing machinery from underneath the car. Machinery can be kept somewhat cleaner and the tires more nearly free from exposure to oil if the runways on which the machine enters the garage are elevated 2 in. or 3 in. above the floor grade.

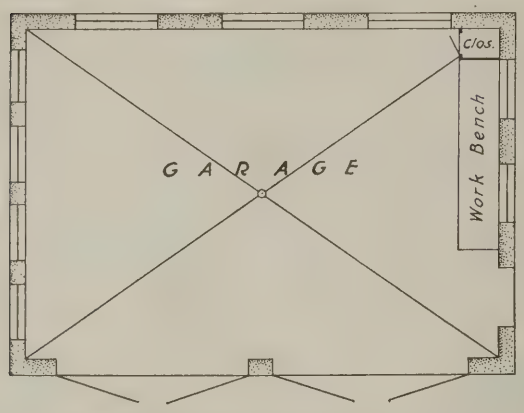
An underground gasoline storage tank encased in



FIG. 1—PICTURE OF THE FINISHED CONCRETE GARAGE IN A CHICAGO SUBURB

6 in. of concrete and equipped with a gasoline pump should be provided. The top of this tank may be 2 ft. below the floor level. Of course the tank should be placed and encased before the floor is laid, and arrangement provided for filling it through a pipe running to and located outside of the building.

The floor should be sloped to a central drain that is in turn connected with a pipe leading to a sewer or similar outlet so that when washing down cars or washing floors waste water can be quickly led away. A swivel hose attachment fixed to a water supply pipe at the center of the ceiling of the garage will permit a man washing cars to carry the hose completely around without twisting or other obstruction.



FLOOR PLAN—SCALE, ⅛ IN. TO THE FOOT

After laying out the foundation area in the usual manner, excavation should be made to a sufficient depth to insure that the bottom of the wall footings will be below possible frost penetration and a uniformly firm bearing secured. All roots and rubbish must be removed, and all soft or spongy spots excavated and the holes refilled with gravel or suitable earth tamped solidly.

In laying the floor drain sufficient fall (at least 1 ft. in 100) should be provided, and an inlet be placed at proper elevation to correspond with the surface of the finished floor at the center of the structure. Drains and inlets should be protected from injury or displacement during construction of the building. The inlet should preferably be of cast iron and provided with bell trap to prevent sewer gas return, also with a grating so that refuse cannot enter and clog the drain.

Lumber used for "forms" should preferably be well air-dried and surfaced on one side and two edges. It should also be reasonably clear stock; that is, free from knots or other imperfections that will cause imprints to be left on the finished wall surface. Forms should be carefully braced in proper position, with studding spaced not more than 2 ft. apart, and well tied together with wires to prevent bulging while placing and tamping the fresh concrete. Before placing any concrete in the forms they should be carefully checked up to ascertain whether they are properly centered, lined and leveled. Faces of forms should be painted either with soft soap or equal parts of boiled linseed oil and kerosene preliminary to placing the concrete, and just before depositing concrete they should be thoroughly drenched with water. All forms should be left in place until the concrete has acquired sufficient strength not only to be self-sustaining, but to support any loads which are to be imposed upon it. If carefully planned and constructed, forms can be removed



FIG. 2—THE CONCRETE FLOOR LAID BEFORE THE WALL "FORMS" HAD BEEN ERECTED

so that they may successfully be used to reproduce the same structure a number of times; and when removed they should be well cleaned of any adhering concrete or dirt and repainted with oil or soft soap. Then they should be stored where protected from the warping influence of sun and wind.

Coping may be cast separately if desired, in units of convenient size. These may readily be set in place in the wall forms, where they are bedded in cement mortar. Beam ends which project from the outside walls under the eaves may also be pre-cast if so desired. In such a case they should not be less than 12 in. long, 5 in. of which length is embedded in the wall, additional tieing in place being produced by embedding light rods or heavy wire in the beam ends when they are cast, allowing rods or wires to project, so that when the beam ends are placed in position this reinforcing will be embedded in the concrete of the walls and roof.

Any standard cement will meet the needs of this construction if it conforms to the standard specifications for Portland cement adopted by the American Society for Testing Materials. Any cement that contains lumps which cannot be pulverized between the fingers should be discarded as unfit for use. Sand or screenings from clean, hard, durable rock or gravel may be used as fine aggregate, provided the material is graded from fine to coarse with the coarse particles predominating and passes when dry a screen having four meshes per linear inch. Fine aggregate should be clean, hard, free from dust, loam, vegetable or other foreign matter, and if more than 3 per cent of clay or loam is present the sand should be washed before being used.

Coarse aggregate may be clean, hard, durable crushed rock or gravel, graded in size from ¼ in. up to 1½ in. in greatest dimension, free from dust, loam, clay, vegetable or other foreign matter, and should contain no soft or elongated particles. Natural mixed aggregate, generally known as bank- or pit-run gravel, should not be used as it comes from the deposit, but should be screened through a ¼-in. screen so as to separate the material into two classes. Then the fine and coarse materials should be remixed in the proportions recommended for the work. Mixing water should be clean, free from oil, acid, alkali, or silt.

Steel bars which are to be used as reinforcing metal should meet the usual requirements of specifications for material of this kind. All bars noted on the accompanying plan are round steel, except the ⅝-in. bars in the lower part of beams. These are square twisted steel. If any other form or type of bar is used it must correspond in cross sectional area of steel at least equal to that of the type in place of which used. All reinforcement should be lapped at least 2 ft. at splices, the lapped ends separated at least 2 in. and lightly wired, so that no displacement will occur. Horizontal bar laps should be distributed so that no two consecutive laps will come together. The ⅝-in. bars used in the beams should be sufficiently long to extend from one end of the beam to the other without splicing.

Materials used, including water, should be measured by some method which will insure separate and uniform proportions of each at all times.

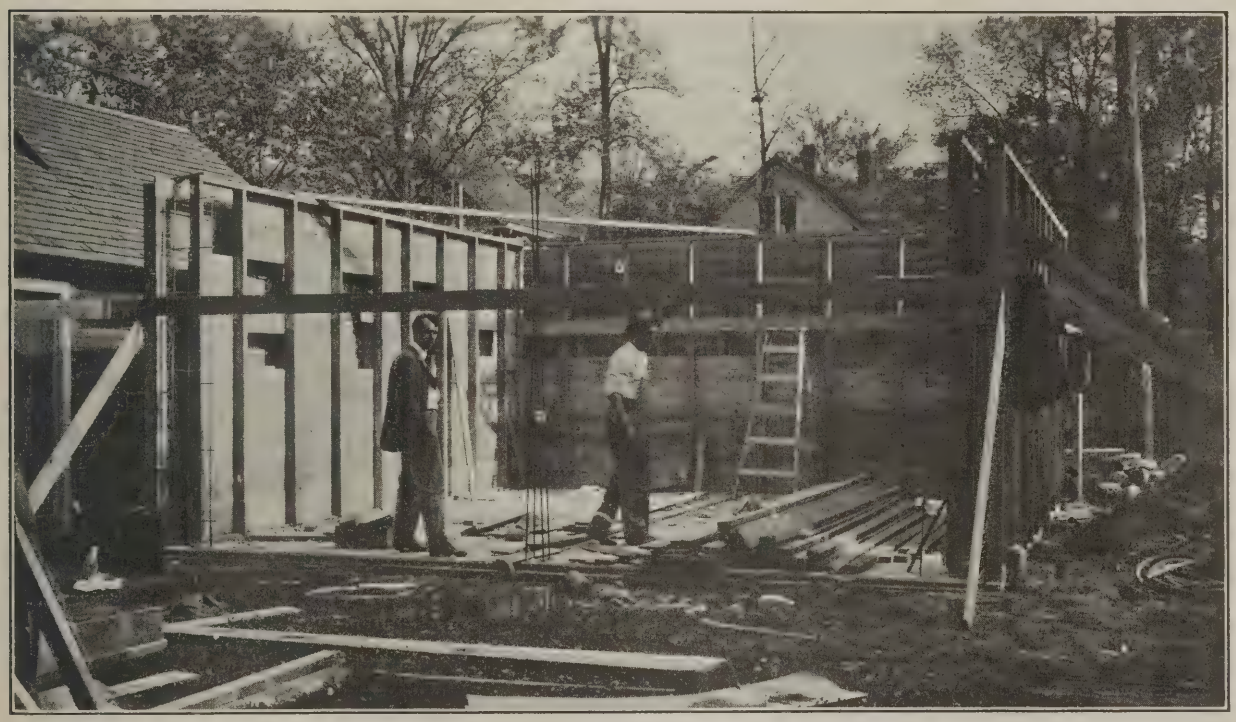


FIG. 3—APPEARANCE OF THE WORK AFTER THE "FORMS" HAD BEEN PUT IN PLACE

A bottomless box is a convenient device for measuring sand and gravel; and this may be of any convenient capacity from 1 to 4 cu. ft. If larger than 1 cu. ft. capacity marks should be placed around the inside to denote the various bulks contained at the levels marked. A sack of Portland cement, 94 lb. net, is considered 1 cu. ft. in proportioning concrete by volume. Materials should be mixed in batches of convenient size, either in a mechanical batch mixture or by shovels on a level, watertight mixing platform, and mixing should continue until the concrete is of uniform color and consistency. Retempering of mortar or concrete which has commenced to harden, that is, remixing such concrete with additional materials or water, should not be allowed. Materials should be mixed with water to produce a concrete which, when deposited, will settle to a flattened mass of its own weight, but not wet enough to cause separation of the coarse aggregate from the mortar in handling. If cold weather prevails during construction, recognized precautions should be taken with the work, such as heating materials and mixing water and protecting the concrete from cold until it has sufficiently hardened to be safe from injury against possible freezing.

MIXTURES FOR CONCRETE WALLS

Concrete for all wall construction should be mixed in the proportions of one sack of Portland cement to not less than 2 nor more than 2½ cu. ft. of sand, and 4 cu. ft. of crushed stone or screened gravel of the quality and sizes already described. If an exterior stucco or pebble-dash finish is intended for the structure, the walls may be built of concrete mixed in the proportions of one sack of Portland cement to 2 cu. ft. of sand to 4 cu. ft. of gravel or stone, and the concrete when placed should not be spaded next to the outside forms, then there will be a rough surface left on the wall that will provide a better bond for the stucco. This should be applied as soon as possible after the forms are removed. Roof and beams should be made of concrete mixed in the proportions of 1 sack of Portland cement, 2 cu. ft. of sand and 3 cu. ft. of gravel or crushed stone. The floors should be laid in two courses, consisting of a 5-in. base and a 1-in. wearing course. Concrete for the floors should be mixed in the proportions of 1 sack of Portland cement to 2½ cu. ft. of sand to 4 cu. ft. of screened gravel or crushed stone, and the wearing course should be made of mortar mixed in the proportions of 1 sack of Portland cement to 2 cu. ft. of sand.

Concrete for the walls should be carefully puddled or rodded to release entrapped air and to compact the mass. It should also be spaded next to the forms to insure a smooth, dense surface, unless, as already mentioned, stucco or pebble-dash finish is desired. The upper portion of the walls and the roof and beams should be constructed as one unit. When necessary to discontinue work on the walls, as at night, for instance, the concrete in the forms should be left rough so that a good bond may be developed between the fresh concrete to be placed the next day and that previously placed. When ready to begin work again the upper surface of the concrete already laid should be carefully cleaned, drenched, and covered with a cement grout consisting of cement and water mixed to the consistency of cream.

ROOF CONSTRUCTION

Roof reinforcement should be assembled at points convenient to the sections of the roof where it will be used, those rods requiring it having previously been bent. Rods making up the reinforcement of the lower portion of the slabs should then be placed, blocking them up three-fourths of an inch above the forms with previously prepared cement blocks three-fourths of an inch square made in strips and broken into desired lengths. Reinforcing should also be securely wired together at intersections so that the rods will maintain their relative positions. Bars which run at right angles to the beams are bent into the top of the roof slab where they pass over the supports. After having carefully placed the steel for all reinforced concrete beams and the roof it should be wired in position, and the concrete should then be deposited so that it will thoroughly surround the steel and be free from air pockets. Work should be so planned that concrete for the beams and roof will be placed in one continuous (uninterrupted) operation.

After being placed concrete should be struck off to its approximate surface by means of a straightedge.

Workmen should not be allowed to step or walk upon the concrete within 48 hr. after it has been struck off.

After the concrete has been in place a sufficient length of time to permit the surplus water to rise to the surface, and it is ready to finish, it should be floated with a flat wooden float similar to a tool used by plasterers.

Finishing should be done from a bridge supported by the wall scaffolding, and no part of the bridge should touch the concrete roof.

PROTECTING THE CONCRETE

While hardening, the roof should be protected from too rapid drying in hot weather (and from possible freezing in cold weather), by covering with some material such as canvas or straw. In hot weather the covering should be kept wet by frequent sprinkling for not less than a week.

Wall forms can be removed from 48 to 72 hr. after placing the concrete, provided the weather has been warm and favorable to curing. It is advisable to sprinkle the concrete frequently for several days after removing forms.

Side forms for beams may be removed in two weeks after concreting. The bottom of the form and its supports should remain in place a full month under favorable weather conditions.

Forms for the roof slabs should remain in place not less than two weeks. Central supports must be set up, however, which should be left in place for a month after depositing the concrete.

The subgrade for the floor should be leveled and solidly tamped so that in final shape its surface will be 11 in. below the drain top at the center of the floor. All soft and spongy spots should be removed and replaced by firm material which should be rammed to give a solid bearing. No vegetable or similar matter should be left in the subbase.

Upon the subgrade clean steam boiler cinders should be placed and tamped to a depth of 5 in. at the drain, and increased in depth toward the wall to give the slope indicated on the drawing. Cinders should be wet down and solidly tamped so that the surface of the cinder foundation will at all points be not less than 6 in. below the level of the finished concrete floor surface.

Previous to placing the concrete for the floor, strips of tarred felt or asphaltic roofing, 6 in. wide, should be prepared. A sufficient number of these strips should then be placed together to make a thickness of at least ⅜ in., which is used to provide a joint between the floor and the wall. When ready these strips should be placed on edge along the wall entirely around the garage and the concrete of the floor placed against them.

Concrete for the base should be placed upon the dampened cinder foundation in a continuous (uninterrupted) operation over the entire floor area. It should then be tamped to conform to the finished floor surface, but at least 1 in. below it so that at all points the wearing course may be not less than 1 in. thick.

Within from 30 to 45 min. after the concrete for the base has been laid, a wearing course should be spread upon the base, worked well into it and struck off with a straightedge guided at one end by a strip of finished surface beginning at the wall and at the other by 1 x 4-in. board laid flat. The mortar for the wearing surface should in no case be brought up entirely to the 1 x 4-in. guide-board, as cracks are likely to appear at such places due to a line of cleavage being formed.

After the wearing surface has been in place a sufficient length of time to permit all surplus water to rise to the surface and it is ready to finish, it should be floated with a flat woden float similar to a tool used by plasterers, and then troweled lightly with a finisher's steel trowel. The finisher should work from two knee-boards or pallets 1 ft. 6 in. by 2 ft. in size, using one for the feet and the other to kneel upon. Overtroweling should be avoided.

If placed in warm weather the floor should be protected while hardening from too rapid drying by a covering of sand or earth which should be kept wet for not less than a week, or by flooding with water during the same period. If placed in cold weather the floor should be protected by a covering of enough straw or sawdust to prevent injury from freezing.



FIG. 4—THE CONCRETE GARAGE AFTER THE "FORMS" FOR THE WALLS WERE REMOVED

Rough or loose places found in the concrete after the forms have been removed should be patched with cement mortar mixed in the proportions of 1 part Portland cement to 2 parts of sand as specified for concrete.

Mortar to be used in laying up the coping blocks or other units should be mixed in the proportions of 1 part of Portland cement to not more than 2 parts of clean sand, all of which will pass a sieve having 10 meshes per linear inch and which

shall be graded from fine to coarse size. This mortar shall be fixed in convenient sized batches so that it will all be used within a period of 30 min. No remixing of partially hardened mortar with additional materials or retempering with water should be permitted.

If the foregoing instructions are carefully followed the resulting structure will represent the maximum safety and efficiency in construction of this type. At the same time the cost will not be much, if any, greater than would be involved in a similar structure of impermanent type. First cost of concrete is the last cost, as maintenance expenses such as painting, insurance on the structure and repairs are eliminated.

In the construction of the garage illustrated herewith somewhat radical changes were made to the extent of using a fire-resisting rather than an absolutely fireproof roof.

Timber framing was placed and the ceiling inside was formed by using metal lath upon which a thick coat of cement mortar was applied. The same kind of casing was used around the overhang of the roof, while the roofing material is cement asbestos shingles. This construction, while not so effective in opposing fire as would have been the monolithic concrete roof, nevertheless offers a very effective fire-resisting construction and probably lowered the cost somewhat, although the owner objects to giving cost figures.

The accompanying pictures represent various stages of the work of construction based on the floor plan given on page 68. Fig. 2 shows the floor of the garage laid before the forms had been erected and the side walls placed, which is a rather unusual practice. Fig. 3 shows the work after the forms for the wall had been put up, while Fig. 4 shows the structure as it appeared after wall forms were removed. The concrete as deposited in the forms was spaded principally at the center in order to purposely leave a rather rough exterior surface to afford a better bond for stucco which was applied, as seen in the picture, Fig. 1, showing the finished structure.

SUGGESTIONS FOR VARNISHING WOODWORK

ELIMINATION OF DUST—MAKING THE CEILING DUSTPROOF—PROPER TOOLS—APPLYING THE VARNISH

ONE of the most important points to be observed in varnishing woodwork after it has been properly prepared for the operation is the elimination of dust. If the varnishing is done in a special room set aside for that purpose, it is an easy matter to keep the room dustproof. Quite often the main reason for dust settling on freshly applied varnish is a faulty ceiling, especially when a workroom is directly above the varnishing room. Such ceilings can be cheaply and effectively rendered dust-proof by fastening heavy cardboard or plaster boards on them and then applying a cheap, plain-tinted wall paper over it, or any other thin paper.

Another cause of raising dust is the flooring. A faulty floor with wide open cracks and boards not securely fastened will raise dust when walked over. This can be cheaply and easily overcome. To putty up the cracks would in most cases be considered too troublesome and expensive. A cheap crack filler for that purpose can be made by mixing a thin glue solution with sawdust and applying same to the cracks with a broad knife. In the larger openings the hot mixture can be poured in, thereby saving time. All floors, says George Wingelt in the *Painters' Magazine,* should be frequently oiled, using a cheap paraffine oil applied with a mop, brush or broom. An ordinary size room would not require more than one-half to one gallon of oil to do this at an expense of from fifteen to twenty-five cents, but it would avoid a good deal of trouble and would save considerable time in finishing, besides resulting in a better job.

In new buildings, where the varnish is applied on woodwork after it is placed, and with workmen constantly passing by, the dustless varnishing method is, of course, considered impossible; still, a good deal of dust can be avoided if the room could be closed for at least a few hours after varnishing, or until the varnish has sufficiently set to be dustproof.

Another point to be observed is that a room where varnishing is to be done should be cleanly swept, and to aid in sweeping some dampened sawdust should be used. Instead of moistening the sawdust with water, it is preferable to use kerosene for the purpose.

A good many varnishers are spending considerable extra time in finishing instead of going to the trouble of spending a few minutes previous to starting the work to avoid or prevent dust. If the sweeping of the room can be done a reasonable time previous to varnishing, it will allow the dust raised by sweeping to settle and be of assistance in keeping the dust from adhering to the fresh varnish.

Proper tools are essential in the application of varnish. The best brush for the work is a chiseled oval brush about 5-0 or 7-0, or a double thick flat brush from 2 to 3 in. wide. Pure bristles are needed for a good varnish brush, and mixed stock or black bristles are not recommended. The best brush obtainable is none too good and is cheaper to use than an inferior or cheap brush. Always make sure that the brush will not shed bristles.

Another necessary tool for varnishing is a good duster; one which will take the dust out of the corners and crevices without doubling up.

In varnishing doors and framework the deeplying sections must be coated first, and the sur-

rounding moldings next, after which the rails and finally the stiles or uprights are done.

Varnish must not be rubbed in, but applied with a light but firm stroke of the brush. To avoid sagging or curtains, the surface should be crossed with the brush; however, the application must be done quickly, particularly if the varnish is of a quick-setting nature or the temperature is not favorable for the work.

At any rate, to go over the surface a second time must be avoided. The appearance of "gooseskin" under the brush will indicate the time to keep away with the brush.

Always work from the center toward the edges on flat surfaces to prevent fatty runners on the corners or edges.

A good varnish, if properly applied, will level itself without great effort by the finisher, and a fairly quick-setting but otherwise well-acting varnish is to be preferred to a slow-setting article.

Before recoating varnish make sure that the under coating is thoroughly dry, which can be ascertained when by sandpapering no gumming up is noticed. Some varnishes may appear dry on the surface and to the touch, but are still soft underneath. A slight pressure with the tip of the finger should leave no impression, which would show a perfectly dry state. The first coats of varnish may be slightly sandpapered or rubbed with steel wool, but the finishing coats, except the last coat, should be mossed only; that is, lightly rubbed with curled hair or haircloth. The final coat should be perfectly leveled or glazed; that is, after applying the varnish and before it has a chance to set, brush lightly over the surface, using only the tip of the brush without any perceptible pressure, to produce an even, glossy surface without imperfection.

These points are for plain work only, as in high class work, such as carriage varnishing or for polishing purposes, much greater care in all details will have to be observed in order to make a satisfactory job.

COMFORT STATIONS AS A PUBLIC UTILITY

RESULTS OF A CAMPAIGN BY A NATIONAL COMMITTEE—A TYPICAL DESIGN

VALUABLE information in reference to the construction of public utilities, the name which is more likely in the future to be used in connection with public comfort stations, is now available to those who are seeking for aid in taking up this work in any locality. As the result of the campaign conducted under the auspices of the National Committee of the Confederated Supply Association, a Comfort Station Bureau was established at 261 Broadway, New York City, in charge of J. J. Cosgrove. One of the recent publications which the Bureau can supply on application is a complete description of the origin and development of the comfort station with a plan of a type of model station that is recommended as well adapted to the public needs.

It provides for a main entrance hall or waiting room with seats from which entrance through anterooms can be had to the public toilets. There is a counter at the rear of the waiting room which leads to a parcel room with telephone booth for the benefit of the public, and from this room there is entrance through anterooms to pay toilets for men on one side and women on the other. The plan includes those conveniences which are widely needed and which aid in providing an income from the parcel service to recompense the attendants for the care of the station. The provision of a parcel room in connection with a public station entitles it to be called a public utility because of the greater usefulness it provides to the general public in addition to those sanitary conveniences, easily accessible which at times are indispensable. Drinking fountains are an important feature of the equipment. The plans are by Ernest Flagg, the well known New York architect, and full particulars for erecting a station can be supplied in connection with them.

A TALL CONCRETE BUILDING

There has just been completed in Hoboken, N. J., an important addition to the terminal facilities of New York Harbor, this being a twelve-story concrete structure forming one of the numerous terminal lofts lately completed by the Hoboken Land & Improvement Company. The stories are 14 ft. 6 in. in the clear and there are about 1,000,000 sq. ft. of floor space in the terminal development at the present time. The contract was executed by the Turner Construction Company of New York City.

CONVENTION OF NORTH CAROLINA BUILDERS' EXCHANGE

At a recent meeting of the Executive Board of the Builders' Exchange of North Carolina, held in Greensboro, it was decided to hold the annual convention of the organization in Raleigh, N. C., on Jan. 23 and 24, with headquarters at the Yarborough Hotel, the business meetings to be held in the rooms of the Chamber of Commerce.

In revising the building code of Toledo, Ohio, efforts are being made to limit the size of buildings that may be placed on lots. The Commissioner believes that a house 26 ft. wide should not be built on a 30-ft. lot, as is the case now, and which is causing much congestion.

A CEMENT AND HALF-TIMBER COTTAGE

A STRIKING DESIGN EMBODYING A PLEASING COMBINATION OF VARIOUS BUILDING MATERIALS



WE feel sure our readers will be interested in the cottage design of rather unusual treatment which we have taken as the basis of our colored supplemental plate this month. A cream yellow stucco exterior with half-timbered gables contrast with a dark green shingled roof, although if preferred gray slate may be used for the roof covering. The massive stone chimney which serves the living room and which appears just at the left of the main entrance porch together with the field stone underpinning add to the picturesqueness of the design. Entrance to the cottage is directly from the open porch to the living room, the main feature of which is its open fireplace in the front wall. The face of this fireplace is to be laid up in reddish brown square tiles with struck joints and the hearth is to be finished in the same material. The back hearth is to have fire brick laid in fire clay mortar. An ash dump to the cellar is to be built in with iron trap set in the hearth. The room measures 13 x 20 ft. in size and communicates with the dining room at the right through an arched opening. These two rooms occupy the front of the house and are lighted by windows on two sides.

KITCHEN AND PANTRY

Directly in the rear of the dining room is a commodious, well equipped pantry with sink placed under an outside window, which affords ample light. From this pantry descend the stairs to the cellar, these being located directly under the main flight, thus resulting in economy of space. Beyond the pantry in turn is the kitchen, which is reached from the outside from the rear porch. At the left of the kitchen is a bedroom for the maid and beyond this the bathroom, so placed as to be convenient for the bedroom beyond it and also from the small hall which communicates with the living room and with the main flight of stairs. On the second floor are three sleeping rooms with ample clothes closets, also a toilet room.

According to the specifications of the architect, the foundation walls are to be composed of 16 in. rubble masonry, random coursed, resting on a bed of concrete serving as footings, and extending 6 in. on both sides of the walls.

FRAMING TIMBERS

The framing timbers are to be of 2 x 8 in. spruce for the first and second tier of beams, well braced with herringbone bridging; the studs are to be 2 x 4 in., placed 16 in. on centers, and doubled at all openings. The rafters are to be 2 x 6 in., placed 20 in. on centers. The outside frame is to be covered with sheathing boards, over which is to be placed a layer of heavy building paper, and this in turn by metal lath to which the exterior stucco tinted a cream yellow is to be applied.

THE ROOF

The rafters are to be covered with roofing boards, with a small space between for ventilating the shingles, and covered with heavy building paper or roofing felt, as the owner may elect. In case slate or asbestos shingles are used the roofing boards are to be laid tight and should be tongued and grooved stock. The half-timbering in the main gables and also in that of the main entrance porch is to be built up of strips on the sheathing and laid on grounds to provide space for lapping on the stucco.

The open porch floor is to be finished off in cement and scored to imitate 8 x 8 in. tile. The cement is to be tinted a light reddish brown. The chimneys are to be constructed of random coursed rubble masonry, the same as the underpinning of the house, and to be topped with bluestone caps and chimney pots projecting 1 ft. above them. All flues are to be carried up with as little bend as possible and to have terra cotta flue lining 1 in. thick. All joints are to be struck smooth on the inside. The rollway to the cellar is to be constructed with stone walls and have bluestone steps.

All ridges, valleys, hips, tops of sash and around chimneys, rollway, etc., are to be flashed with tin, painted both sides. The leaders are to be round, of 3 in. diameter and the gutters are to be of heavy No. 24 galvanized iron painted two coats with Prince's metallic paint.

The fireplace is to be provided with a black iron mantel hood securely set into the masonry construction of the chimney.

THE FLOORS

The floors of the rooms in the main story are to be double, the sub-floor consisting of rough tongued and grooved boards, while the finish floors are to be of $\frac{7}{8}$ x $5\frac{1}{2}$ in. tongued and grooved best quality maple with joints broken and the flooring blind nailed. The rooms in the second story are to have floors of a single thickness of highly figured pine.

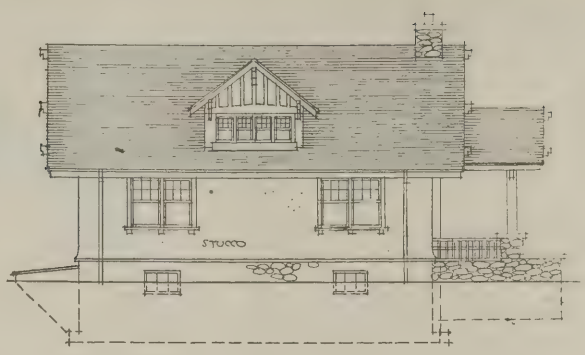
All window frames and trim are to be of white pine or cypress, according to preference, and the main entrance door is to be 2 in. oak veneered on a white pine core. All other doors except in the kitchen are to be $1\frac{1}{2}$ in. thick and of the five-panel variety. Pantry doors are to be double swing.



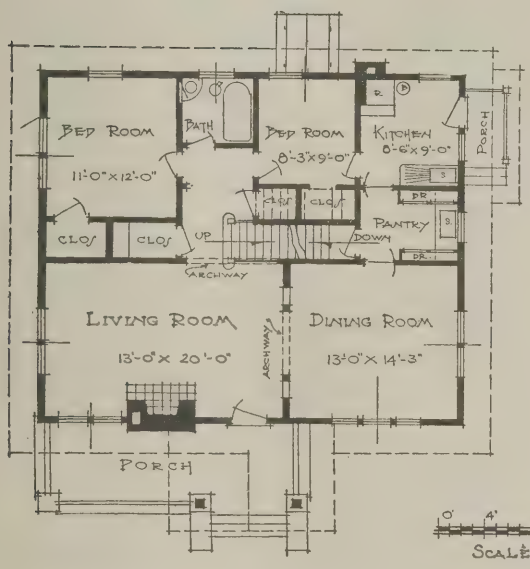
BUILDING AGE
NEW YORK

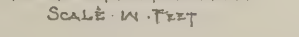


FRONT ELEVATION

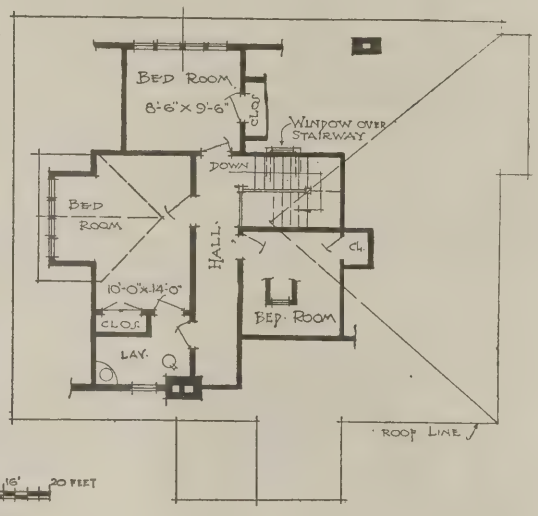


SIDE ELEVATION





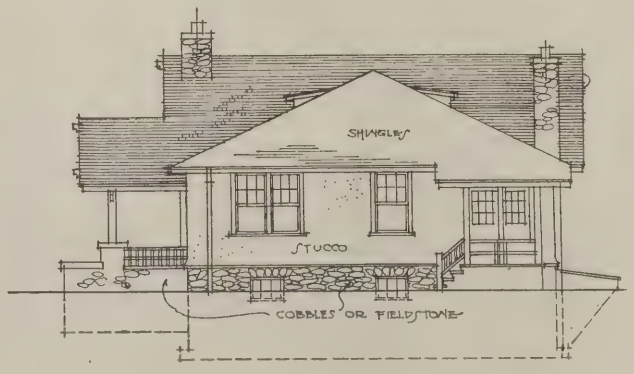
FIRST FLOOR PLAN



ATTIC PLAN

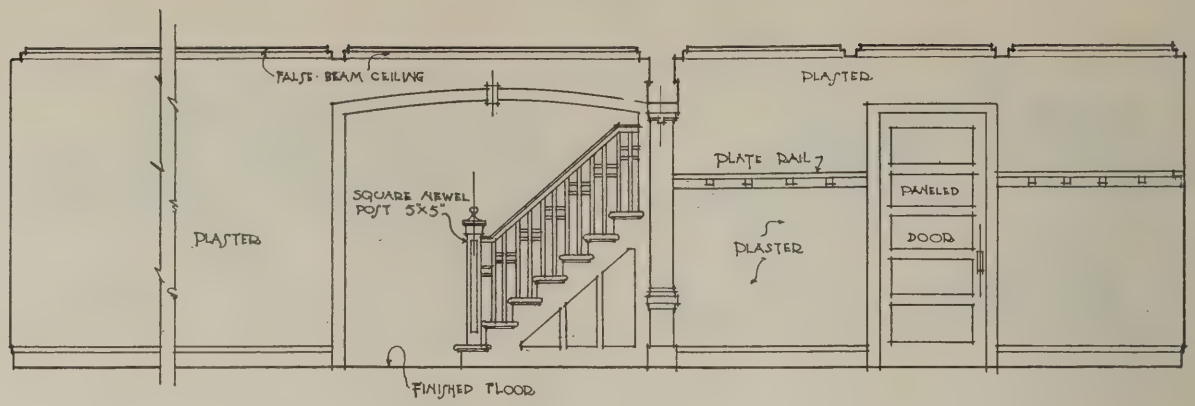


REAR ELEVATION



SIDE ELEVATION

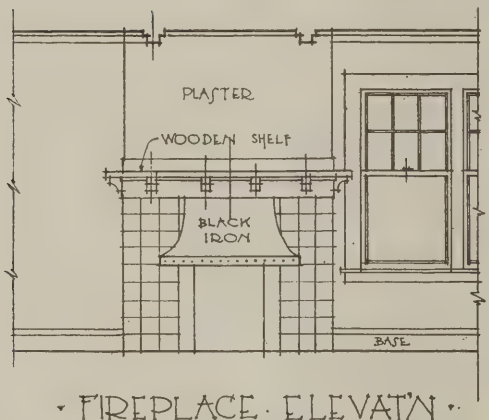
PLANS AND ELEVATIONS OF COTTAGE SHOWN ON THE COLORED SUPPLEMENTAL PLATE



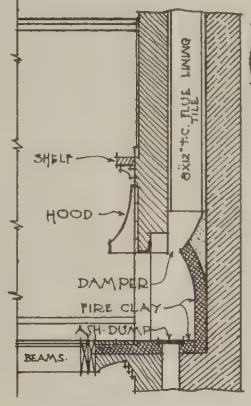
ELEVATION SHOWING LIVING AND DINING ROOMS

SCALE 0 1 2 3 4 5 6 7 8 FEET

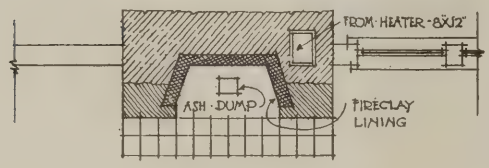
(LIGHTING FIXTURES NOT SHOWN)



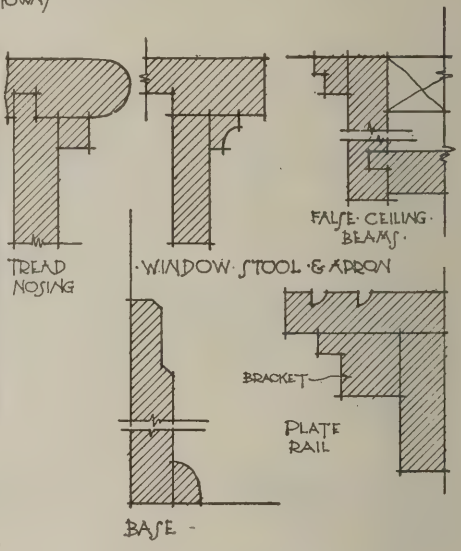
FIREPLACE ELEVAT'N



SECTION



...TILE FOR FIREPLACE TO BE RED MORAVIAN TILE, 6"x6" SQUARE. CAST IRON DAMPER TO BE SET IN NECK OF FLUE. ORNAMENTAL HOOD OF BLACK IRON TO BE SECURELY SET IN POSITION AS SHOWN ....



INTERIOR FINISH DETAILS

0 1 2 3 INCHES

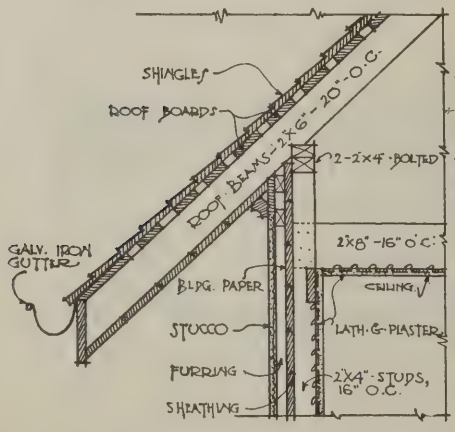
SCALE

PLAN Scale 0 1 2 3 4 5 FEET

ELEVATION, PLAN & SECTION OF LIVING R'M. FIREPLACE

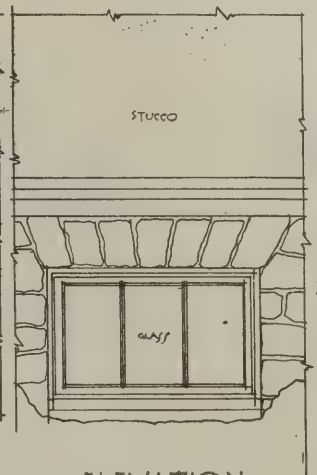
0 1 2 FEET

SCALE FOR FLOWER BOX BELOW

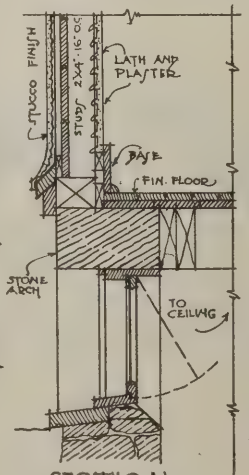


TYPICAL CORNICE DETAIL

SCALE 0 1 2 3 FEET



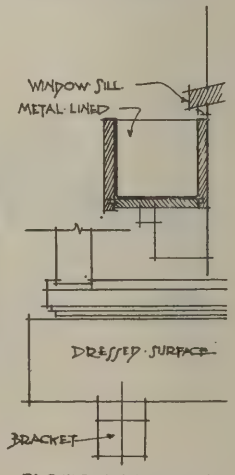
ELEVATION



SECTION

CELLAR WINDOW DETAIL

SCALE 0 1 2 FEET



SECTION AND END ELEVATION OF BOX FOR FLOWERS.

CONSTRUCTIVE DETAILS OF COTTAGE SHOWN ON COLORED SUPPLEMENTAL PLATE

The soffits of the exterior cornices are to be sheathed with tongued and grooved dressed stock and trimmed with neat moulds.

The plastering throughout is to be three-coat work with a sand finish for all rooms on the first floor except the kitchen and pantry. The closets are to have a hard white finish. The rooms in the second story are to have a hard finish with the exception of the hall, which is to have a sand finish, so as to match that of the lower hall.

The fixtures in the bathroom are to be of porcelain with nickel plated pipes and attachments. The pantry and kitchen sinks are to be of enameled iron and all pipes and branches are to be properly hung and fitted. The system is to be provided with mushroom vent at grade and fresh air indet. A range is to be provided for the kitchen with a 40 gallon boiler connected to the supply system.

The heating of the cottage is to be done by hot air and the wall studs are to be so placed as to allow of the installation of the sheet metal flues. Where the latter pass along walls, metal lath is to be used instead of wood lath. The furnace is to be connected with a fresh air inlet box through one of the cellar windows.

The house is to be provided with properly constructed lines for gas and electricity, the gas main to be 7/8 in. and the risers 5/8 in. All electric wires are to run in flexible tube cabling. Outlets are to be provided in all rooms for combination fixtures, which are to be of the latest pattern and design, with black iron or dull bronze drop pendants for the living and dining rooms. Wall outlets are to be provided for all rooms.

All necessary butts, bolts, locks, hinges and essential ornamental hardware are to be properly fitted and the finished hardware is to correspond in finish to the lighting fixtures.

All exterior trim is to be given three coats of paint and finished in Van Dyke brown. The roof shingles, if of wood, are to be given two coats of dark sap green shingle stain, which is to be well brushed on and worked into the joints. If slate or asbestos shingles are used no stain will be required.

The first floor interior wall trim is to be stained and varnished Sepia brown. The second floor interior trim is to be finished with three coats of pearl gray enamel paint well rubbed down between coats.

According to the figures of the architect, the cubic content of this cottage is 24,720 cu. ft., on which he places a unit price of 21c on account of extra masonry construction for foundations, chimneys, etc., and half-timbered work. This estimate, he states, does not include the contractor's profit, nor does it cover any particular locality, on account of varying conditions of labor and supply markets. According to his figures some of the more important items are as follows. He allows $850 for the masonry, foundations, chimneys, cement, etc., $110 for excavating and grading, $2100 for carpentry and mill work, $400 for the plumbing, $280 for the plastering, $420 for the heating, $200 for the metal work, $270 for the painting, and $320 for the gas and electric installation and fixtures.

The plans and specifications were prepared by Architect Frank T. Fellner, 413 Caton Avenue, Brooklyn, N. Y., or care of THE BUILDING AGE, 50 Union Square, New York City.

HINTS ON CONCRETING IN COLD WEATHER

INFORMATION THE BUILDER WILL FIND VALUABLE WHEN DOING CONCRETE WORK IN WINTER

THERE are many occasions when the builder finds it necessary or desirable to do concrete work in the winter months when the temperature is considerably below the freezing point. In rural districts much work of this nature is done as the farm hands can be kept busy at a period when they would otherwise have little to do. Fence posts, watering troughs, barn and stable floors, etc., can be made in winter if only a little care is exercised. A convenient room for carrying on cold weather concrete work indoors can usually be arranged by fixing up some portion of a shed, barn or cellar. Sand and pebbles should be brought into the workroom and stored until desired for use. The temperature in the room should be kept not lower than 50 deg. Fahr. In a pamphlet sent out by the Portland Cement Association a number of valuable facts for the builder doing outside work to remember are given, among which are the following:

Remember that during the first few days following the placing of concrete, alternate freezing and thawing at comparatively short intervals will damage it.

Remember, therefore, that it is necessary to so mix, place and protect the concrete that early hardening will be complete before the work is exposed to freezing temperatures.

Remember that to do this:

(1) Sand and pebbles or broken stone used must be free from frost or lumps of frozen material.

(2) If these materials contain frost or frozen lumps, thaw them out before using.

(3) As cement forms but a relatively small bulk of the materials in any batch of concrete, it need not be heated.

(4) Mixing water should always be heated.

Remember that although adding common salt to mixing water will prevent freezing of concrete that has not hardened, there is a limit to the quantity of salt which may be added if the final strength of the

concrete is not to be affected. Salt simply lowers the freezing point of the mixing water; it does not supply what is most needed—heat and warmth. It delays, instead of hastens, the hardening of the concrete.

Remember that sand and pebbles or broken stone and mixing water must be heated so that the concrete when placed shall have a temperature of from 75 to 80 deg.

Remember that some sands are injured by too much heat. The same applies to certain varieties of pebbles and broken stone. A temperature not exceeding 150 deg. Fahr. will generally prove most satisfactory.

Remember to place concrete immediately after mixing, so that none of the heat will be lost before placing it in the forms.

Remember to warm metal forms and reinforcing before placing concrete. Be careful to remove ice and snow and frozen concrete remaining on the forms from preceding work. Forms can be warmed by placing a jet of steam against them or by wetting with hot water.

Remember that even though materials have been heated and the concrete placed immediately after mixing, it will lose much of its heat if not protected from low temperatures.

Remember, therefore, to protect the concrete immediately after placing. Canvas covering, sheathing, housing-in the work, or hay or straw, properly applied, will furnish the required protection for some work. In addition to these means, small oil or coke burning stoves or salamanders may be used in inclosed structures.

Remember that temperatures which may not be low enough to freeze the concrete may, nevertheless, delay its hardening for a considerable time. Do not expect concrete placed when the temperature is low and remains low for some time afterward, to be safe for use as soon as though placed during warmer weather.

Remember that if concreting is unavoidably delayed or interrupted the work should be covered until concreting is again begun.

Remember to cover and protect any sections of the work as soon as completed. In severe cold weather, continue this protection for at least five days.

Remember that forms must not be removed from the concrete work too early. This applies to any concrete work, regardless of season, but is particularly important with work done during cold weather.

Remember that frozen concrete sometimes very closely resembles concrete that has thoroughly hardened. When frozen concrete is struck with a hammer, it will often ring like properly hardened concrete. Before removing forms, examine the work carefully to see whether it has hardened or is simply frozen. To determine this, remove one board from some section of a form, pour hot water on the concrete or turn the flame of a plumber's blow torch or a jet of steam under pressure against the concrete. If frozen, the heat will soften the concrete by thawing the water contained in it.

Remember that although concrete which freezes before early hardening has been completed may not be permanently injured, if after thawing out it is not again exposed to freezing until hardened, protecting the concrete against possibility of freezing is best.

OFFICERS OF MASTER BUILDERS ASSOCIATION OF AUSTIN, TEX.

In our last issue we made mention of the fact that leading building contractors in Austin, Texas, had effected an organization under the name of Master Builders' Association, since which time we learn that the following officers had been chosen for the ensuing year:

President.....O. L. Allright
Vice President.....Scott Yeamans
Secretary-Treasurer... John R. Cox

The new association has adopted a somewhat different constitution, by-laws and code from former kindred associations so far as known in that only general contractors and superintendents are admitted to membership and no contractor can be a member of any trades union. Another stipulation is that the members endorse the Quantity Survey System.

MODEL HOMES FOR INDUSTRIAL WORKERS

In order to provide housing accommodations for the new industrial plant which it is designed to establish at Allwood, New Jersey, by William L. Lyall, president of the Brighton Mills of Passaic, a model village has been laid out and the first forty homes of modern construction will soon be erected. There will also be a school house, churches, and a library.

The factory will be of the new one-story type and the contract for the work has been secured by John W. Ferguson of Paterson, New Jersey. The location of the factory will be in the valley along the Newark branch of the Erie Railroad and the model village will be on a hill overlooking Passaic and from where on clear days one can discern the skyscrapers of the metropolis.

The architects are Murphy and Dana of New York, and the planning of the landscape work will be in the hands of John Nolan, city planner and landscape architect of Boston.

What are said to be the largest stones ever set in any structure in America are contained in the new Lincoln Memorial, three of the stones used being slabs of marble each over 6 ft. high and 19 ft. long, and weighing about 28 tons. According to the architect, Henry Bacon, there are more than 800 pieces of stone in the Memorial weighing from 12 to 25 tons each.

THE ART AND SCIENCE OF HANDRAILING

COMMENTS BY AN EXPERT, WITH DESCRIPTION OF A NEW METHOD OF TANGENT SYSTEM

By C. F. Stark

THE science of handrailing, up to its present state, has always been more or less susceptible to changes of structure, and as a consequence a variety of different arrangements of the science exists. Chiefly noticeable are the forms that are classed under one or the other of two headings, the one known as the "Tangent System," and the other as the "Falling Line System."

Methods of the latter class may be said to aim, above all else, at the strict observance of a predetermined falling line made in the elevation. But, as a rule, it must be confessed that in the abstraction of this aim other things just as important are lost sight of. For instance, in devising methods of this kind it seems forgotten that there can be stages of confusion and complexity reached in which a method ceases to be practical or to enter into the ordinary comprehension. Yet it may well be doubted that the tangent, or any other system, has anything to gain from an added scope which makes its form of the science more or less impracticable. Broadly speaking, however, it is being generally recognized that in any theory of handrailing the thing of primary importance is its ultimate practical value. Experience will show that the intensely practical method is the extensively adopted one, and perhaps the nearest approach to this ideal is found in methods of the "tangent system." It will be seen that even there, however, the falling line of the rail is a feature which can never be wholly disregarded.

The object of the present article may be briefly stated as consisting in a careful attempt to induce a more practical conception of the science, and it is thought that in presenting a brief sketch of a modern tangent method the best way is taken to the securing of this object. Also, anything that can render such a conception more familiar can hardly be regarded unfavorably.

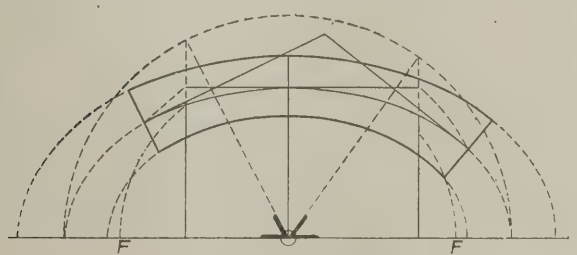
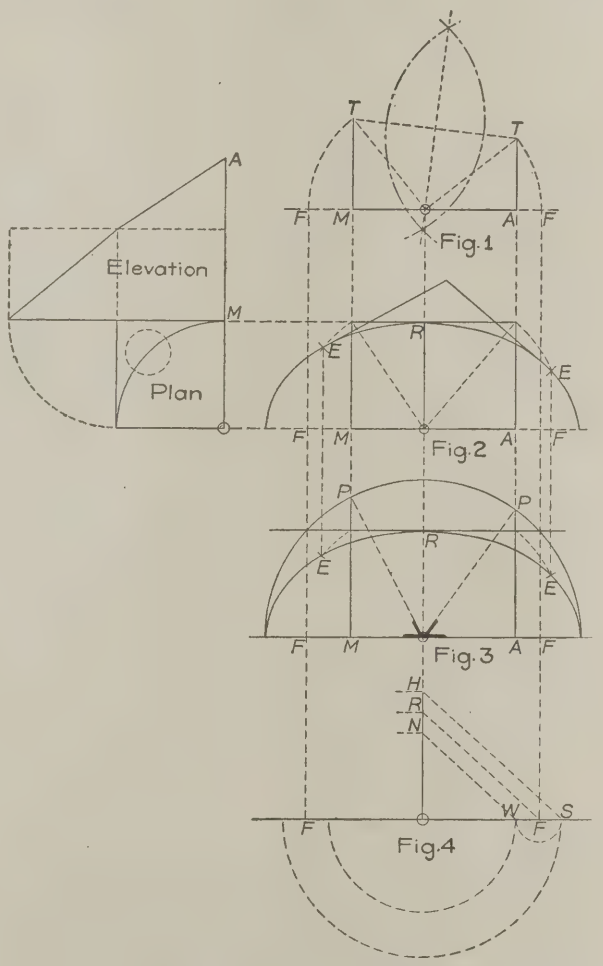


Fig. 5—The Face Mold

The instance here assumed, as will be seen in the plan and the elevation of tangents, is, in general, typical of all those cases where an approximate predetermination of the falling line is usually considered sufficient. That in any such case as the one shown some predetermination of this feature is arrived at cannot help but be concluded from the fact that one certain disposal of the tangents is always judged to be better than any other disposal of them. For on what other basis could the preference be supposed to rest?



Figs 1 to 4 inclusive—Showing Various Stages of the Work

Here, however, a further remark seems necessary. The above example must by no means be taken as indicating that tangent methods can never consistently come to a stricter observance of this feature. For, although of this stricter regard, it was earlier viewed as something of a stumbling block; there is yet reason for believing that a more mod-

ern form of the science will sooner or later change this aspect of it.

The diagrams which accompany the present article illustrate a method devised during the last five years. In them no more is sought than we ought to expect, when any ordinary tangent method is employed. But besides the plan, elevation, and the complete face-mold drawing, four other figures will be noticed. The purpose of these latter is to convey a distinct and orderly idea of the four successive steps involved in producing the mold and the bevels. It seems that if they are closely considered no misunderstanding can arise. Perhaps, however, here it should be mentioned that all consideration of the inner and the outer curves of the mold is left until Fig. 4 is reached. Also, since the tangents and other data of these figures, if viewed from the center of ellipse, correspond to a similar part of the plan as to the right or to the left, when the plan is similarly viewed from its center; accordingly, they will often be thus referred to.

THE TWO TANGENTS

Starting then with Fig. 1, the heights of the two tangents, as taken from the elevation, are arranged in the following manner: The line *M-A* in Fig. 1 is first made to equal the height of both tangents taken together, as may be seen by inspecting *M-A* of the elevation. Then it is extended on either hand to act afterward as the major-axis-line. Next, from the two points *M, A;* two lines, *M-T, A T,* are squared up, *M-T,* on the left, being made equal to the height of the left-hand tangent, and *A-T,* on the right, being made equal to the height of the right-hand tangent.

Now, in the line *M-A,* the point *O,* which is the center of ellipse, must be determined, and it is imperative that its situation in the major-axis be equidistant from the two points, *T* and *T.* Now, if we bisect a line joining the points *T* and *T* by a perpendicular, and continue this latter to intersect the major-axis, the point of intersection will be equidistant from the points *T, T.* Hence this point of intersection must be the center of the ellipse. In this manner the point *O* has been determined.

DETERMINING THE FOCI

Now we turn attention to the following fact, which is: that by the above simple arrangement of the tangent heights and later determination of the center *O* we discover the exact distance which separates the foci from the center of ellipse—that ellipse of which some part corresponds to the plan center line. The length *O-T* of either one of the two dotted lines equals this distance. Therefore, if from the center *O,* with radius *O-T,* the two arcs *T-F* and *T-F* be described, the points *F, F* will be the positions of the foci.

Thus the determination of the foci, the chief object of Fig. 1, has been accomplished. The figure, however, has another important aspect. It will be realized soon that its simple arrangement, used as the basis of the succeeding figures, takes us, as it were, right through the heart of the problem.

In proceeding, it is presumed that the student is well acquainted with the fact that the semi-minor axis of ellipse is always equal to the radius of plan; and also that he will experience no difficulty in describing the ellipse when the foregoing data are at hand. This then brings us to a consideration of the next figure.

CONSIDERATION OF THE SECOND DIAGRAM

Fig. 2 shows the semi-minor-axis squared up from the center *O;* and also the semi-ellipse, described by fixing a string at the points *F, F.* It also illustrates how to pick out just that portion of the curve necessary, and how the tangents may then be marked on the mold. First, the lines *M-T* and *A-T* of Fig. 1 are now, in Fig 2, made to equal the semi-minor-axis. A line is then drawn parallel to the major-axis-line, forming the two rectangles *M R* and *A R.* In the rectangles, diagonals are drawn from the point *O* as seen. With the diagonal of the left rectangle as a radius, and the point *O* as a center, an arc which is made to intersect the semi-ellipse to the left will show where the curve of the mold terminates. Similarly, the termination of the curve to the right is found by using the diagonal of the right-hand rectangle as a radius from the center of the ellipse; and that portion of the ellipse lying between the two intersected points *E, E,* is the correct center line of the mold. The tangents are then drawn from the points *E, E* parallel to the springing lines. These springing lines, if made, would join the points *E, E* with the center *O.*

THE THIRD STEP OF THE PROCESS

Fig. 3, exhibiting the third step of the process, deals with the bevels only. As a matter of interest, it may be mentioned that the bevel for any section along the wreath can be found in a similar way as are these at the joints. Here a part of what is termed the "auxiliary circle" is seen described about the semi-ellipse. To describe it the semi-major-axis is used as a radius, as seen in the figure. And now again the lines *M-T, A-T,* of Fig. 1, to which recourse was made in Fig. 2, are found of further use. They are now extended to meet the circumference of the semi-circle at the points *P, P.* The bevels for the joints are then found in the acute angles formed by lines joining the points *P, P* to the center *O* and the major-axis line. The bevel to apply on the left tangent is found to be left of center, while the one to apply on the right tangent is seen to the right of center.

In Fig. 4 we reach the final part of the process. For the completion of what was begun in Fig. 1 we require the positions of the foci, from which the inner and the outer curves of the mold may be described. First, the semi-minor-axis *O-R* is increased by adding half the width of rail *R-H* to its length, and a line is then drawn joining *R* with the point *F,* the focus which was determined in Fig. 1. Next, a line is drawn from *H* parallel to the line *R-F* to meet the major-axis line at the point *S,* which is thus determined as a focus of the outer

curve. And since the distance of a focus is the same from the center on either side of the minor axis, the distance *O-S* may be easily transferred to determine the focus of the outer curve on the other side. The point *W* in Fig. 4 indicates the position of a focus for the inner curve of the mold. It may be found in a manner much similar to that just described. Decrease the semi-minor-axis equal to what it was previously increased, by making *R-N* equal *R-H*. Then draw from *N* the line *N-W*, parallel to *R-F*. Or the point *W* may be found by describing the small semicircle *S-W*, using *F* as center and *F-S* as radius. And finally transferring the distance *O-W* to the other side, the mold may be completed.

Here it might not be out of place to assure the student who has followed out this method that its description may be confidently accepted as a general rule, or set of rules, to be applied whenever the plan is a quarter circle and the falling line not strictly regarded.

And further, it would seem that some of its advantages cannot fail to become apparent. Among them may be noted the practical nature of the work in laying out the face mold Fig. 5 also the fact that its simple and direct drawing leaves it, much less than other methods, open to inaccuracies. And finally, where the curves of the mold, as in the present case, are required to be curves of an elliptical order, the ease with which they are here correctly found allows no excuse for the unscientific practice of substituting uncalled-for curves of another kind, such as are obtained from bending a lath.

A SPECIFICATION FOR STUCCO WORK

WHAT A WESTERN ARCHITECT HAS TO SAY ABOUT SPECIFYING WORK OF THIS KIND



PROBABLY no one phase of dwelling house construction is meeting with more widespread interest than that in connection with the use of stucco. Questions in regard to its application are constantly arising and the discussions which have ensued have been both profitable and instructive. As bearing upon this phase of the subject, Henry F. Hoit, a Kansas City architect, tells in the following words how he specifies the stucco work for some of his buildings.

Concrete plaster, or what is generally termed "stucco," offers so many possibilities to the architect, especially for suburban and country home work, that the enterprising men in the profession cannot afford to overlook it. It fits so harmoniously into a landscape made up largely of greensward, shrubbery and overhanging trees; its plasticity allows the architect to exercise his creative powers unhampered by close limitations of the material in which he is working; while it appeals to the owner not only on account of its beauty, but because of its permanence if properly put on and its freedom from any excessive annual cost to keep it in condition.

It cannot be denied, however, that many builders, eager to get seeming results with the least expenditure, or ignorant of the true nature of the materials with which they are working, have put up a large amount of stucco work which will not stand the test of time—and this test is, as I see it, one of the first things to be thought of in designing any kind of concrete work. We are compelled to see in almost every locality stucco houses with walls which crack, peel off, are caved in by accidental heavy blows, or have fallen down entirely because of the failure of the metal to hold its load of plaster.

All these things led up to a desire on my part to formulate a specification which would produce a stucco acceptable to the best class of clients, men of taste, and with means to provide handsome and permanent homes for themselves.

My starting point, I think, was a determination in my own mind that an air space back of a stucco coat is fundamentally wrong. For one thing, it is a point of weakness, giving the plaster an opportunity to break under any sudden impact, such as a tool being thrown against it, the falling of a tree branch, or the depredations of destructive children. An air space, unless the stucco is back-plastered, also offers an opportunity for corrosive influences to work destructively on the metal lath. To avoid this air space I decided on two expedients: a thinner furring than the ordinary strip, and a type of metal lath which would allow the plaster to go through it readily and adhere closely to the building paper covering the sheeting.

My furring strips are 5/16-in. steel rods, placed 8 in. on centers, and held in place with staples. Over these is placed galvanized wire cloth, held in place with galvanized staples at the furring rods. The wire cloth is made of No. 18 wire, with mesh 2½ squares to the inch and galvanized after weaving.

By insisting on having the plaster a full inch in thickness, I thus get what is practically a 1-in. reinforced concrete wall, with the metal completely embedded in it, and with the added advantage that this wall of plaster is not standing alone, as is usually the case, but is adhering closely to the backing provided for it.

I might say, too, that I specify 2 x 6-in. studding on all my work, instead of 2 x 4-in., as this gives

more stability to the wall, with less liability to cracking of the plaster from settlement, wind pressure and the like. I use matched sheeting, placing it on the studs diagonally, and over this I specify an extra good grade of waterproof building paper. This latter is something which is often neglected, but it should not be; the general belief seems to be that paper is paper, that a membrance of some fibrous substance is all that is necessary for the purpose, the cheaper the better. As a matter of fact, this paper has a two-fold purpose, that of insulating the house against both cold and moisture. Any kind of paper will probably help to keep out the cold, but the thicker and more densely woven it is the better will be its insulating power. To keep out moisture, however, it must be scientifically prepared with any one of a number of weather-proofing preparations.

My stucco specifications in detail are as follows:

All lathing for stucco shall be galvanized wire cloth No. 18 wire, 2½ x 2½ mesh, as per sample submitted to and approved by the architect, securely fastened on walls with galvanized iron staples over 5/16-in. steel rods, 8 in. on center.

On this lathing everywhere put cement 1 in. thick, three coat work, with rough cast finish, sample of which must be made to meet with the architect's approval before any work is done.

First coat shall consist of 1 part cement and 3 parts, by measure, of clean sand. To every barrel of cement used, one bucketful of lime putty may be added, which has been previously slacked and to which a large quantity of long fibre or hair has been added.

Second coat to consist of same material and proportions as the first, with the exception that the fibre or hair is omitted.

The last coat to be done with 1 part Atlas white cement and 2 parts of Carthage crushed limestone No. 112. Before mixing add 2 lb. of Medusa waterproofing compound to each sack of cement used in the finish coat, mixing same thoroughly with the dry cement before adding the crushed limestone or water. Hydrated lime may be used instead of Medusa.

Finish coat to be dashed on with a brush, and to be tinted with mineral color a light cream-white; color subject to approval of architect.

This is taken verbatim from the specifications drawn up recently for a residence for one of my clients. The provisions in regard to the materials used for the finish coat would, of course, vary according to the design of the architect and the taste of the owner.

There is under construction at Perth Amboy, N. J., the only building in the state to be occupied by a commercial organization and with a permanent exhibit of the industrial products of the territory it represents. It will be called the Board of Trade Building, will be three stories high and constructed of brick and terra cotta. The industrial exhibits will be arranged in booths which will be leased to manufacturers.

POPULARITY OF THE ENCLOSED PORCH

The carpenter has finished his task and the long porch, veranda, piazza or stoop has been enclosed for the winter. The radiators, exposed to the weather five months in the year, have been regilded. Father has started a fire in the furnace. A comfortable warmth pervades the house. The French windows stand open. No one will consent to stay in the apartment known thirty years ago as the sitting room, twenty years ago as the parlor, ten years ago as the drawing room, and commonly designated as the living room to-day, says the *New York Times*. Everybody has moved into the enclosed porch; the whole family wants to live in the glass house.

The popularity of enclosed verandas is recent but striking. There are certain difficulties in the way of their universal installation. They call for large or long radiators. The plumber, with a serious air, tells you that one square foot of glass requires ten times as much radiating surface as a square foot of plastered wall. He shakes his head as he says you will have to have a boiler two sizes larger. He specifies that the lattice work beneath the porch shall be bricked up. You agree to all his conditions because you have tasted the pleasures of dwelling outdoors the year round.

There is a pleasanter style of country life. It really matters little whether the enclosed porch is an integral part of the house, a room with a hardwood floor, ivory trim and a fireplace, or just a pine floored stoop with rough shingles on one side. The point is that the other three sides are in glass. The glass may be bevelled plate or may consist of mere latticed panes set in a hothouse frame and screwed in place. Either floods your outdoor room with sunlight, either lets you look out on the snow decked trees and the drifted lanes, while, warm as toast, you lounge in a deep wicker chair, gay with flowered cretonne cushions, reading the morning paper. On a card table at your elbow rests the breakfast tray loaded with crisp toast and steaming coffee.

RAPID METHOD OF DRYING HEMLOCK

A rapid method of kiln-drying eastern hemlock has been developed whereby it is said that shiplap can be dried green from the saw to shipping weight in 48 hours, and the 2-in. plank in from six to eight days, the method being developed in the course of co-operative experiments which are being conducted at the Forest Products Laboratory at Madison, Wis., by the Forest Service and the Northern Hemlock and Hardwood Manufacturers' Association. It is said that the material comes from the kiln in excellent shape, and that there is practically no loss due to drying.

Asphalt, which was known to the ancients, is said to have been employed as a binder in masonry by the Babylonians.

MOTOR TRUCKS AID BUSINESS EFFICIENCY*

EXPERIENCE OF BUILDERS IN THE USE OF MOTOR TRUCKS—VALUABLE COST FIGURES

CONTINUING the records of experience of contractors and builders in the use of motor trucks, the following are interesting and instructive to those contemplating the substitution of them for horses and wagons.

George H. Miller, a contractor and builder of New London, Conn., used his Reo truck, made by the Reo Motor Car Co., Lansing, Mich., on one occasion to convey from twenty to thirty men from New London to Chesterfield, the round trip being a distance of about twelve miles. During a period of four weeks there were days when it was necessary to drive through mud for about a mile, yet he never lost a trip.

A one-ton Pierce motor truck, made by the Pierce-Arrow Motor Car Co., Buffalo, N. Y., is indispensable to the business of F. E. Petersen of Chicago, who has operated it for six years with economy and efficiency. The truck is called upon to make anywhere from ten to seventy-five miles every day, and is despatched all over Chicago. Getting men on the job promptly and taking them from one place to another is an important factor to a contractor that has to pay his men 75c. per hour, and he cannot afford to waste any time. Mr. Petersen says he couldn't get along without a truck, and in the past six years he has enjoyed many benefits from its use.



A One-Ton "Pierce-Arrow" Motor Truck of F. E. Petersen, a Prominent Builder of Chicago



A ¾-Ton Republic Motor Truck Owned by a Firm of Mason Builders in the Middle West

One thousand dollars seems a lot of money for a contractor and builder to spend on a truck, yet that is the sum invested recently by Anton Haugen of Chicago. He uses a one-ton Sterling, made by the Sterling Motor Truck Co., West Allis, Milwaukee, Wis., and used a similar machine prior to purchasing this late model. His son drives the truck, and he is authority for the statement that twelve miles can be covered on a gallon of gasoline. He hauls lumber, cement, or anything required on the job ten or fifteen miles from the shop. Work is done with profit in the suburbs because of the truck, but a horse and wagon could not be expected to do what the power wagon undertakes.

E. D. Dougherty, a Chicago carpenter and contractor, replaced four horses and wagons with a ¾-ton Republic truck made by the Republic Motor Truck Co., Alma, Mich. The owner says that the truck is indispensable and covers from forty to fifty miles every day. He hauls the men's tool chests, crushed stone, cement, etc., all over the city and to the suburbs. In the sixteen months that he has operated the truck it has cost him $9 for repairs. Workmen are usually sent direct to the job, but when occasion requires a man or two is carried in the truck to the work. The truck is housed in a brick garage adjacent to Mr. Dougherty's home.

Some interesting information is contributed by the Reo Motor Car Co., Lansing, Mich., regarding the cost of operating its Model J, two-ton truck.

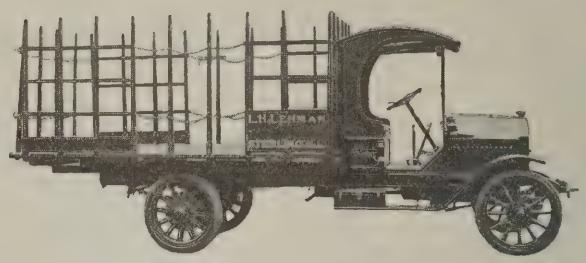
The average mileage obtained by over a hundred owners whose testimonials were picked at random was 8.65 miles on a gallon of gasoline. This, the company believes, is a conservative estimate where a capacity load is carried over the average roads. Oil consumption, like gasoline, depends on conditions, essentially the quality of oil and temperature. An average taken from about fifty records showed 93.7 miles to every quart of oil used. The company estimates that the annual depreciation of a truck is about 15 per cent, and this point is dwelt upon, as depreciation must be considered in figuring costs per ton per mile.

The following data is a result of actual and careful compilation of the average performance of a Reo Model J two-ton truck, thirty miles daily, against

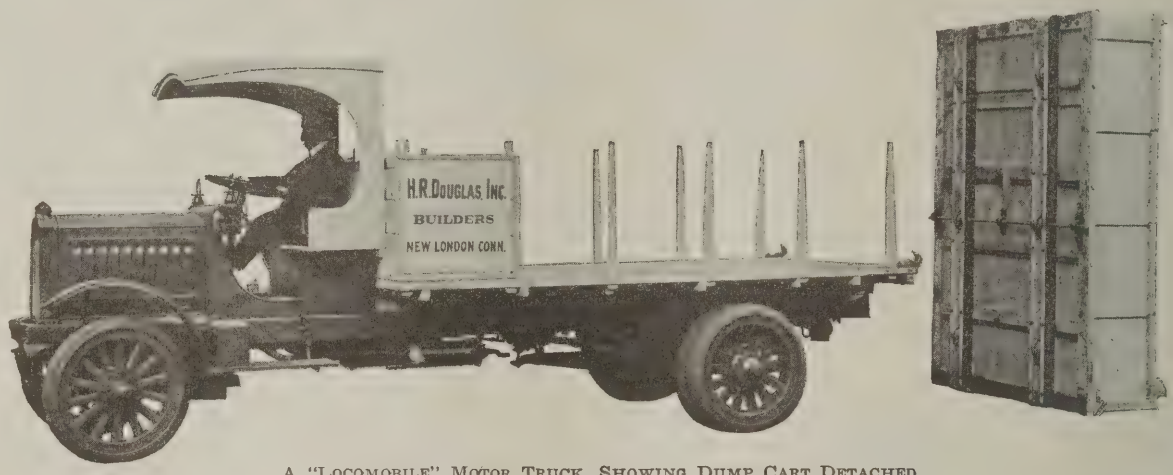
*Continued from page 49, December issue.



A "SERVICE" MOTOR TRUCK



A "LITTLE GIANT" MOTOR TRUCK



A "LOCOMOBILE" MOTOR TRUCK, SHOWING DUMP CART DETACHED



AN "AUTOCAR"



AN INTERNATIONAL HARVESTER CO. MOTOR TRUCK



A "KISSEL KAR" MOTOR TRUCK



A "WILLYS-OVERLAND"

MOTOR TRUCKS AID BUSINESS EFFICIENCY—A FEW STYLES NOT SHOWN ELSEWHERE

two teams, same load, fifteen miles each daily for one month (twenty-five working days).

108 gal. gasoline, 20c	$21.60	Feed 4 horses, $15 mo.	$60.00
2 gal. engine oil, 50c	1.00	Shoe 4 horses, $1 mo.	4.00
2 lb. grease	.20	Veterinary & medicine ($10. yr. ea.)	3.35
Tires 750 miles, 2c.	15.00	Interest (6%)	8.45
Depreciation (20%)	27.10	Depreciation (15%)	21.13
Overhauling ($100 yr.)	8.35	Insurance	2.00
Interest (6%)	9.00	Paint and overhaul	5.00
Insurance	2.33	2 drivers	125.00
Driver	62.50		
Monthly operating and fixed cost	$147.08	Monthly operating and overhead cost	$228.93

Above is figured on an investment based as follows:

1 Reo Model J chassis	$1,650.00	2 teams, $500	$1,000.00
1 body	150.00	4 harnesses, $40	160.00
		4 blankets, $7.50	30.00
		2 trucks, $250	500.00
Total investment	$1,800.00	Total investment	$1,690.00

Short hauls and long hauls are two distinct problems, says the Reo Motor Car Co. If the truck is kept on the go, traveling about sixty miles per day, the average cost for a two-ton truck per mile is 8½c. At thirty miles per day the mileage is a fraction under 20c. Even basing the cost on thirty miles the truck will more than save its cost the first year. Owners of such trucks are covering from 8000 to 11,000 miles and upward with one set of tires.

Figures are also presented herewith showing the comparative costs of maintaining a 1½-ton Little Giant motor truck and two double teams.

Cost Comparison of Truck and Horse and Wagon

MAINTENANCE COST OF "LITTLE GIANT" 1½-TON TRUCK		MAINTENANCE COST OF HORSE AND WAGON EQUIPMENT	
Investment		*Investment* (Two Double Teams)	
1 Model H—"Little Giant" with Open Flare Body		4 horses, @ $200.00	$800.00
Chassis	$1,450.00	2 wagons, @ $250.00	500.00
Body	75.00	2 sets harness, @ $35.00	70.00
Total investment	$1,525.00	Total investment	$1,370.00
Fixed Charges		*Fixed Charges*	
Interest on investment @ 6%	$91.50	Interest on investment, @ 6%	$82.20
Depreciation on $1,450.00		Depreciation on horses, @ 15%	120.00
Less tires 98.00		Depreciation on wagons and harness, @ 20%	114.00
$1,352.00 @ 20%	270.40	Painting, overhauling, shoeing and repairs, @ $250.00 per team	500.00
Fire insurance on $1,200.00	30.00	Insurance	75.00
Liability insurance	35.00	Total	$891.20
Painting, overhauling and repairs	80.00	Cost per day, fixed charges	$2.85
	$506.90	*Operating Charges*	
Cost per day, fixed charges	$1.62	Horse and feed, @ $27.00 per month per horse	$1,296.00
Operating Charges		Barn rent, @ $8.00 per month per horse	384.00
Based on 60 miles per day. Gasoline figured 10 miles to the gallon. Oil figured 250 miles to the gallon. Total miles per year, 18,780.		Drivers, @ $65.00 per month per team	1,560.00
Gasoline—1878 gal., @ 19c	$356.82	Total operating charges	$3,240.00
Oil—75 gal., @ 60c	45.00	Total fixed charges.	891.20
Tires, 18,780 miles, @ 0.09 per mile	169.02	Total operating and fixed charges.	$4,131.20
Driver, @ $80.00 per month	960.00	Cost per day operating charges	10.35
Garage, @ $15.00 per month	180.00	Cost per day total.	13.20
Total operating charges	$1,710.84	313 working days per year.	
Total fixed charges.	506.90		
Total operating and fixed charges.	$2,217.74		
Cost per day operating charges	5.46		
Cost per day, total.	7.08		
Tires are figured on a basis of 10,000 miles guarantee with a discount of 40% and 3/10% from list. 313 working days per year.			

George Hume, a Chicago carpenter and builder, thought that $30 a month was too much to spend for the upkeep of a horse and wagon, considering the limited service, so he invested in one of the Chicago Pneumatic Tool Co.'s Little Giant trucks. He is now able to cover long distances with less expense, and business is done at the extreme ends of the city and suburbs.

A man who used a horse and wagon for twenty years and then bought a motor truck should be some authority on the efficiency of both equipments. M. H. McLean of Chicago, a carpenter and builder, does three times the amount of work that he used to do in the old days, and he says that his Chicago motor truck has paid for itself many times over. Mr. McLean believes that a 1500-lb. truck is an ideal one for his business. He insists, however, that every man should know his truck thoroughly and take good care of it. Care should be exercised in starting and stopping. The machine should be cleaned and oiled periodically, for neglect is costly and is inclined to make a man talk pessimistically about a motor truck.

With a view to rendering its delivery service more efficient, and at the same time add prestige to



A Rambler Used by a Cornice and Roofing Concern

its establishment, a sheet-metal concern in Decatur, Ill., purchased a 1-ton "Rambler" motor truck made by the Thomas B. Jeffery Co., Kenosha, Wis. As to the advantages of this move a representative of the buyer said: "Though we have had the truck but a few months, it has demonstrated to our satisfaction that it will be indispensable in the successful conduct of our business. Formerly we had two teams of two horses and wagons, and these by no means were as efficient as our present method of delivery. We figure that the truck will not cost us more than one horse and wagon in upkeep, and consider the splendid service we are able to give our customers. By its use a heavier load can be carried at a much greater speed, and we can get men and materials to the job promptly, and then the truck can be used for a similar service in another part of the city. Furthermore, it gives us the opportunity for expansion, a feature which cannot be enlarged upon too much. With the truck we can carry all materials and men needed for an out-of-town job, complete it and return in a space of time that would be impossible if we made use of horse teams."

BUILDING AGE

(Founded in 1879 by David Williams)

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FEBRUARY, 1917

THE YEAR'S BUILDING OPERATIONS

There are so many important lines of business dependent for their activity upon new building construction work that the operations for which permits may have been issued in any stated period are likely to attract more than passing attention on the part of those engaged in the various branches of the building and allied industries. The official figures covering 117 cities of the country show the value of the building improvements for which permits were issued last year to have been $924,787,875, as against $751,914,079 in 1915, or 23 per cent increase; and of the cities reporting only 24 show decreased activity. Of this comparatively small number, 11 are found in the eastern section of the country, 5 in the Middle West, 6 in the Southern tier of States, and 2 on the Pacific Coast, a record really remarkable in its way. These reports afford an excellent suggestion of coming activity in the spring, for it is reasonable to suppose that much of the work that was planned in the later months of 1916 will not be fully carried out until the approaching building season.

LOCAL BUILDING OPERATIONS

Considering the local situation, it is found that during 1916 there were filed in the three principal boroughs of Greater New York plans for 20,699 new buildings involving an estimated outlay of $175,278,710, as against 18,992 new buildings in 1915 estimated to cost $139,605,846. Of the former amount, $114,690,145 represents the estimated cost of the 564 new buildings planned in the Borough of Manhattan during the past year, these figures contrasting with $64,652,869 for the 489 new buildings for which permits were issued in 1915. This large increase in Manhattan in 1916, as compared with the year before, was due almost wholly to the greater number of apartment houses, hotels, office buildings, store and loft structures, etc., for which plans were filed in May, June, and July. In the last-named month there was a rush to take out permits for imposing structures before the measure was adopted restricting the heights of buildings and preventing the erection of factories in the retail districts of the city. In the last six months of the year the estimated cost of new construction work for which permits were taken out was $62,326,250, of which amount $45,472,250 should be credited to the month of July alone.

CLASSIFICATION OF BUILDINGS

Of the total estimated cost of the projected new building construction during the year in the Borough of Manhattan, $3,065,700 was for dwelling houses, of which there were planned 30 estimated to cost more than $50,000 each; $37,841,500 was for 183 "tenements," which, according to the New York law, embraces all buildings housing three or more families; $26,717,000 was for 27 hotels; $18,030,650 was for 66 stores, lofts, etc.; $12,651,500 was for 43 office buildings; $6,167,600 was for 35 manufactories and work shops; $3,639,500 was for 30 places of amusement; $1,000,000 was for two hospitals, and $2,910,100 was for 87 stables and garages. In the twelve months of 1915, $792,500 was the estimated cost of the 25 private dwelling houses for which permits were issued; $24,960,500 was for 193 tenement houses; $2,030,000 was for 9 hotels; $13,949,500 was for 61 stores, lofts, etc.; $5,535,000 was for 24 office buildings; $1,957,500 was for 20 manufactories and work shops; $1,045,000 was for 5 school houses; $10,454,000 was for public buildings, which includes the $10,000,000 permit for the new County Court House designed by Guy Lowell; and $1,531,250 was for 23 places of amusement.

BROOKLYN AND THE BRONX

In the Borough of the Bronx there were 3687 permits issued during the year just closed calling for an estimated outlay of $18,425,060, these figures contrasting with 3988 permits in 1915 for new buildings to cost $29,351,126. This decrease was mainly due to the falling off in the erection of brick

tenement houses, of which only 224 were planned last year, to cost $12,012,000, while in 1915 permits were taken out for 489 buildings of this class estimated to cost $22,822,000. In Brooklyn, 16,448 buildings were projected last year, involving an estimated expenditure of $42,163,505 as against 14,515 buildings planned in 1915, and involving an estimated outlay of $45,601,851. From these figures it will be seen that an immense amount of work has been projected within the confines of Greater New York, and it is fair to assume that an active spring season will result in which all branches of the building industry will be engaged.

CONVENTION OF NORTH DAKOTA BUILDERS' EXCHANGES

A goodly number of the members of the North Dakota State Association of Builders' Exchanges gathered in Fargo on Jan. 5 on the occasion of the seventh annual convention of that organization. Various matters of trade interest were discussed, a new mechanic's lien law was prepared for passage at the current session of the State legislature and a compensation bill was also introduced.

The election of officers resulted as follows:

President, D. A. Dinnie of Minot.
First Vice-Pres., Thomas Berge of Grand Forks.
Second Vice-Pres., H. Boerth of Fargo.
Third Vice-Pres., W. S. Hulet of Minot.
Secy. and Treas., Victor H. Leeby of Fargo.

In the evening the members were the guests of the Fargo Builders' Exchange at a banquet held at the Waldorf Hotel. Henry Nolen of Fargo acted as toastmaster, and short talks were made by Eugene Young, secretary of the Minneapolis Builders' Exchange, by A. V. Williams, secretary of the St. Paul Builders' Exchange; by Harry Wilbur, who spoke on the proposed compensation bill, and by A. W. Fowler, who discussed the Mechanic's Lien Law.

At the business session in the afternoon it was voted to hold the next convention in Minot, N. D.

SUPPLYING EUROPE WITH BUILDING MATERIALS

One reason for the present high cost of building material is ascribed by some to the options being taken on supplies in gigantic quantities by companies which plan to ship building material by the millions of dollars' worth into Europe as soon as the war stops, says the *Dow Service Daily Building Reports.* Inquiries have been sent here from England, Russia and France in the last month to ascertain the per cubic foot cost of American standard shaped industrial buildings and quickly assembled houses for the employees. According to the specifications received from France within the last week "prices must include complete mill construction ready for setting machinery on floors within thirty days from arrival of material on site, quotations to be f.o.b. New York and cover purchaser into the summer of 1918." One New York company has already made shipments of houses of this sort into South America, and is taking on capacity to meet the requirements of an export business in all kinds of basic building materials which seems sure to develop upon the closing of hostilities.

Not since the early part of the eighteenth century have basic building materials crossed the Atlantic. During and immediately following the American Revolution common brick was imported from Holland for use in New York and Philadelphia buildings. Since then there has been some German and Belgian cement imported, a little marble and some quarry and fine tile, but the exportation of basic building materials has always been considered impractical. Manufacturers now believe that basic building materials like steel, cement, brick, lime, glass, and lumber will soon be exported in large quantities, and for that reason are making themselves prepared when the demand develops.

BUILDING ON LONG ISLAND IN 1916

The development of rapid transit facilities between New York City and its various suburbs to the east has been in a measure instrumental in greatly developing building operations on Long Island during the past few years. According to a report prepared by the Long Island Railroad Company under the direction of Donald Wilson, there were 8890 buildings erected in 1916, as compared with 8895 buildings in 1915. The maximum occurred in 1912, when 9378 structures were erected.

Of those built last year 7196 were dwelling houses, 888 were stores, 38 were factories and 768 were miscellaneous, these contrasting with 7276 dwelling houses. 1007 stores, 31 factories and 581 miscellaneous buildings in 1915.

The scene of greatest activity last year was in Vanderveer Park, a suburban section of Brooklyn, where 894 dwelling houses were erected and 250 stores. At Rockaway Beach 400 dwellings and 50 stores were put up; in Parksville, 345 dwellings and 10 stores; in the Woodhaven section 400 dwelling houses and 50 stores; in Glendale, 400 dwellings and 125 stores; in Jamaica, 300 dwellings and 25 stores; in Hollis, 150 dwelling houses and 10 stores; in Bushwick Junction, another Brooklyn suburb, 250 dwellings and 50 stores; in Bellmore, 200 dwellings, and in Lynbrook 183 dwellings and 6 stores.

PROHIBITS BUILDING ADOBE HOUSES

A new building ordinance at Santa Barbara, Cal., prepared by a special commission and approved by the building department, would prohibit the construction of adobe houses as dwellings. Adobes formerly built are a picturesque feature of Santa Barbara, and while few are now being constructed, several have been going up every year in the suburban districts.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

PRACTICAL SUGGESTIONS FOR THE CARPENTER AND THE BUILDER

From R. W. W., Dayton, New York.—The editorial appeal in the December issue of the paper calling on the younger members of the trade to ask more questions and for the old ones to answer them was done in a nice way and should bear fruit. The winter is just the time for the old and the young members to get together in a more congenial way and discuss every "kink" in the building line.

I read the Correspondence Department first and regret that it is not twice as large. The only way, however, that it can be made so is for every one to help, as the editor suggests, by sending in an article with sketches showing something new or, at all events, new to some of us, and the older "carps" will have to loosen up on some of those problems



Fig. 1



Fig. 2

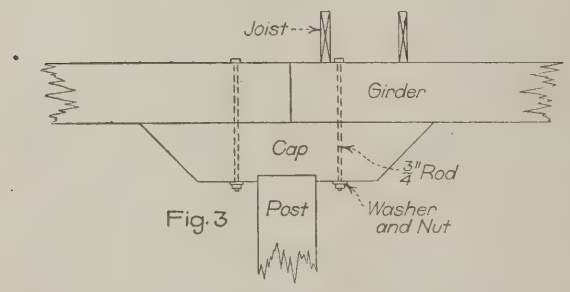


Fig. 3

PRACTICAL SUGGESTIONS FOR THE BUILDER

which seem simple to them and which they have already executed to perfection, but which nevertheless puzzle us. Some veterans seem to think that a young man knows nothing about the work and the principal reason a young man does not like to ask questions is because he is likely to be laughed at in case his idea be the wrong one. I am a young man and have lots to learn, but I can ask more questions than a Philadelphia lawyer. I have had positions offered me with as much money and easier work than the carpenter's trade, but there was always a fascination about carpentry which I could not resist. There is something about a keen cutting saw, a steel square and a new hammer that "gets me" every time, but what "gets my goat," and I believe hurts the business most of all, are the fellows with a $1.98 kit of tools, a cigarette in their mouth, a lost look on their face, one eye on the clock, the other on the Boss and no ambition except to draw cheap wages; do as little as possible and "get away with it." They will make good workmen about as much as a mule.

Another element that hurts is found in those who attempt to contract, but who underbid on numerous small jobs both by contract and day's wages and lose money simply for the sake of getting the work. Hiring the cheapest help and doing a cheap job result in a black eye for the trade in general. Here arises the question if it would not be a good plan to make all carpenters pass an examination and take out a license the same as architects? Some may reason that this element does not last long. No! some go back to farming or work on the section, while others are springing up and everywhere the country is full of them. I desire to forcibly state that if a man takes no interest in his work, does not continually study it, and become so interested in it that he will not know when it is quitting hour, he will never make a success at it; he may be a poor "wood butcher," but never a mechanic.

It is to the advantage of every carpenter and builder to educate the buying public—not how cheap, but how good. I once worked for a nice old man, the best mechanic I ever saw; got good money for his work, used his help right and paid them well. A fellow who worked for him and wanted to learn could certainly do so. Mr. M——, a tight old wad, came to him once and asked him to figure on a tenement house. He wanted it done quickly and cheaply. The old gent told Mr. M—— that he had always made it a practice to do good work, didn't know how to do cheap work and was too old to learn. So many see men getting, say, $4 a day or hear of a contractor clearing $1000 on a single job—all of which looks big to them—that they start in contracting without any study or liking for the work and nine times out of ten the result is a failure.

My advice to the young man starting in the work is to do so with the idea of making it a life's vocation; study it, stick to it and make up your mind to be an expert. Don't get the mistaken idea that the work is easy, for the contrary is quite the case; it is all hard work, but when you are able to stand on the ground and frame a complicated roof for a building which, when placed, all rafters fit perfectly,

then comes a sense of superiority that is all your own. Scribing the cuts may be all right sometimes, but what are you going to do when you want to fit a brace in a place unaccessible to scribing? It is then that you wish you knew how to use the steel square better.

I look for more articles in the Correspondence Department from carpenters who have small shops with gasoline or motor power, a few machines like a planer, jointer and combination saw showing some of the things they make, how they make them and more and larger scale details of drawings.

It is somewhat amusing and refreshing to read the articles of D. P. Barry and "J. P. W.," of Lane, Kansas, regarding different methods in the construction of buildings. I spent last winter in Kansas and was in most every town of any size in the state. I have formed my own opinion concerning Kansas building methods. Out there they could cut a cotton wood and make an outside door sill, but here in the Empire state, where Yankee notions still prevail, we make a sill out of good old honest oak similar to Fig. 7 of Mr. Barry's article, and for public buildings we often screw a piece of iron on top of the rabbet. We find it lasts longer and is not much trouble either.

In the February issue for 1916 W. E. Frudden in his plank frame barn article has the lower rafters 16 ft. long running at 60 deg. and the upper ones 12 ft. long at 30 deg. Are these correct? Should not the upper ones, in order to run 30 deg. and interchange with the lower ones at the bisecting joint, be 11½ ft. long? Are not the upper ones at 12 ft. running 34 deg.? In the detail for framing of extension rafter at a scale of ½ in. to the foot it gives in the underside from the plate 1 ft. extension, and with a scale of ⅛ in. to the foot in the cross sectional view the extension is 2 ft. Which is correct?

A handy article I use is a 10 ft. measuring pole (Figs. 1 and 2), which any carpenter can make out of two pieces of ¾ in. oak each 6 ft. long. Fasten bands of galvanized iron on the end of each piece and another in the center with a set screw so that the pole can be held rigid when measuring less than 10 ft. When pulled out to the 10 ft. point, a screw is used for a stop. Fig. 2 shows the measuring pole when the two parts are slid together. In Fig. 3 there is shown one way of placing a girder in order to carry joist, and which is suitable for barns or other heavy buildings.

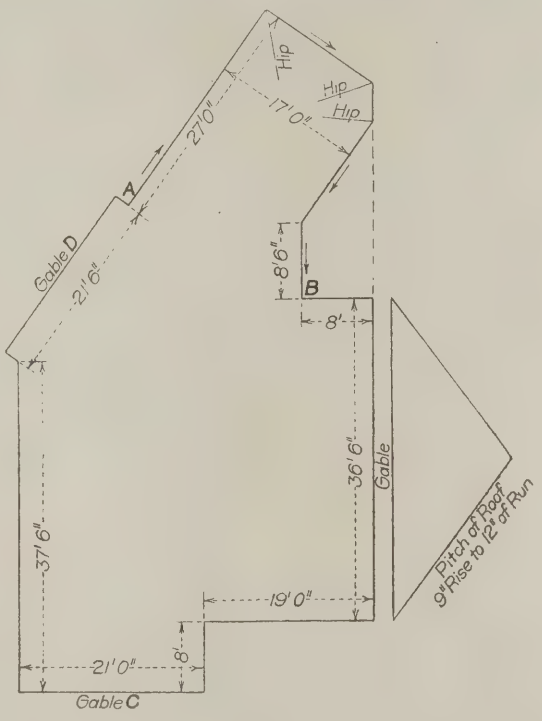
HANGING OUTSIDE BLINDS

From L. R. S., Boonsboro, Md.—I am a new subscriber to THE BUILDING AGE and come to the readers of the Correspondence Department for information. I am not very far advanced in the art and science of carpentry and building, and therefore ask some brother chip to give me a complete description of the best way to hang outside blinds quickly and correctly. I am well pleased with the issues of the paper, which have thus far come to hand, and I believe I shall be greatly benefited by its monthly visits.

A DIFFICULT PROBLEM IN ROOF FRAMING

From C. J. M., St. Johns, Newfoundland.—The diagram I am sending represents the plan of a house we have at present under consideration in our office. On account of its presenting a rather tough problem in roof framing, I am forwarding it to the paper, not altogether that I require information on the subject myself, but I felt it would prove an interesting study for some of the younger members of the craft during the long winter evenings.

Referring to the diagram, the eave, from "A" around to "B," in the direction the arrows are pointing, is 3 ft. higher than that of the remaining portion of the roof. All the rafters through-



DIFFICULT PROBLEM IN ROOF FRAMING

out have the same pitch as shown in the diagram. For the rest the diagram explains itself.

Now, young men, here's a chance to try your skill. You may some day come to work in St. Johns, where we build crooked houses, and this problem will show what you can do. I would like to see the roof worked out both in plan and in elevation. I have had to work it out myself, as that is all in my day's work, but I would like to see how others would work it out.

THE "REAL" CALIFORNIA BUNGALOW

From F. A. Schilling, Architectural Designer, Los Angeles, Cal.—In carefully reading my copy of the December issue of THE BUILDING AGE, my attention has been arrested by the house shown in the first article. I would like to criticise this frame cottage, which, according to the text, is supposed to be influenced by our California bungalow, and I hope my criticisms will be ac-

cepted in the spirit in which they are offered—that is, without malice.

In the first place, the roof is too steep. A bungalow roof is about one-sixth or one-eighth pitch, which, of course, is too flat for sections of the country where there is snow, etc.

Again, a bungalow *never* has an upper story. We call such houses "cottages"—not bungalows.

The windows certainly show the Eastern Colonial influence both in design and size. Bungalow windows are not mullioned, and are wide. The pergola shows no bungalow influence—it is Colonial. The dormers surely are not "bungalonial," to coin a new word; neither are the boxed eaves.

As for the interior, it is just as Eastern as the exterior—no built-in buffets, beds, coolers, etc., even a broad, cased opening is lacking, which, of course, is natural in a cold climate. Even the porch has been made a part of the interior by inclosing it.

A fad has taken hold of some of our house builders and home builders out here, and the result is what is called a "Colonial bungalow," but even these do not resemble the house under discussion. A Colonial entrance is planted on the front of a bungalow, and the eaves are boxed in, with a result that is somewhat startling.

Kindly pardon my criticism, but I would like to set some of our Eastern friends aright on this California bungalow question. A great many seem to think that any cottage is a California bungalow.

MAKING MAGNESITE FLOORS

From J. K. P., Uehling, Neb.—I should like to see published in the Correspondence Department of the paper a description of the method of making magnesite floors, giving details as to ingredients, the quantities required, how mixed, how colored, and how put into place.

Answer.—In reply to the above request, Ernest McCullough furnishes the following information: Any one who wishes to be fully informed in regard to "Composition" or Magnesite floors should obtain a copy of the paper by R. R. Shively, presented at the Urbana meeting of the American Chemical Society in April, 1916, in which paper Mr. Shively described experiments undertaken with a view to standardizing composition floor mixtures. From that paper the following facts have been abstracted.

In 1867 M. Sorel found that a very hard material was produced by mixing magnesia and a solution of magnesium chloride, the mixture being variously known as "Sorel cement" and "composition flooring." In European practice, the magnesia was mixed with various fillers, such as sawdust, sand, terra alba, infusorial earth, or asbestos, and colored with different inorganic colors. This mixture was made into a mortar by adding a solution of magnesium chloride. This mortar was applied to a floor, then leveled, and permitted to stand for a few hours. It was then carefully troweled. After 8 or 10 hours, the cement having set, the surface was usually treated with a coat of oil and was then ready for use. In fact, this represents the common European practice to-day.

The composition is usually applied in two coats, an under fibrous coat about 5/16 in. thick and an upper coat containing less fiber, from 5/16 in. to ½ in. thick. The under coat imparts elasticity to the flooring, which is much less fatiguing than stone, concrete, or other hard floors.

Many failures occurred in America in attempting to use the Sorel floor composition, and Mr. Shively decided, after examining a great many failures and a number of successful jobs, that "rule-of-thumb" processes based upon insufficient scientific knowledge and lack of care in mixing could be blamed. He thereupon made a great many experiments, and gave the results to the public in his paper the present year.

The mixture giving best results was the following:

Magnesium chloride	10 per cent
Magnesia	40 per cent
Sawdust	10 per cent
Venetian red (no substitute)	12 per cent
Clay	20 per cent
Terra alba	8 per cent

The materials were carefully weighed and thoroughly mixed, after which the dry mixture was incorporated with the calculated amount of magnesium chloride solution, and water was added until the proper consistency was obtained. The mixing was continued until all lumps had disappeared, when it was spread. Mr. Shively says:

"The successful working of composition flooring of the type considered does not depend entirely upon the chemical composition, but also upon the mechanical manipulation. The exercise of constant care is necessary in laying the floor and consequently only skilled workmen should be employed in practice. In particular, composition flooring should not be overtroweled, and the necessary precautions should always be taken in laying floors over surfaces which are subjected to heat."

If the correspondent is anxious to get into the business of laying composition flooring, he is advised to read the paper referred to, copies of which no doubt are to be seen in nearly every public library, as well as in those of colleges, universities and technical schools mentioned in the published Transactions of the American Chemical Society.

QUESTION OF BUILT-UP GIRDER CONSTRUCTION

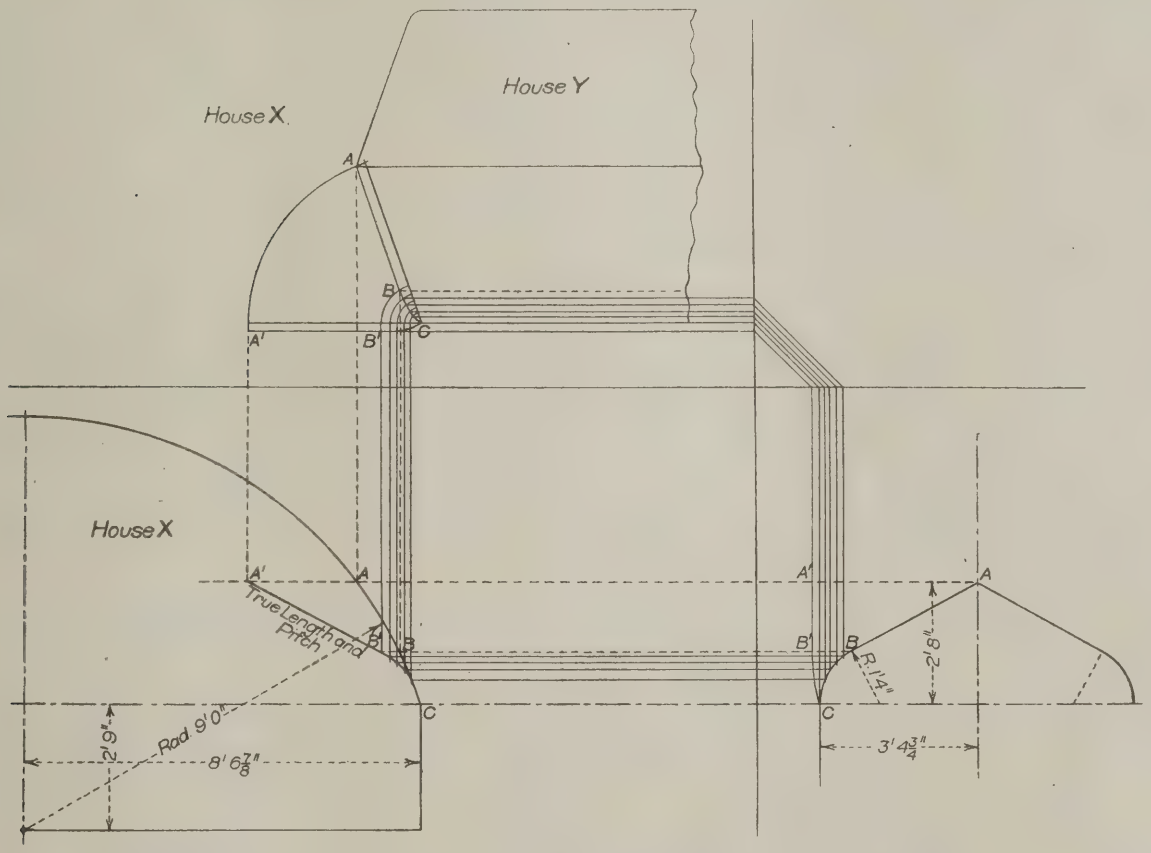
From C. A. C., Holliston, Mass.—I have been a subscriber to the paper for a number of years, and now come to the correspondence columns for help in regard to a problem in built-up girder construction. I am to use an 8 x 10-in. girder, composed of four pieces of 2 x 10-in. plank spiked together. The supporting columns are 10½ ft. on centers, and I desire to know if it is best to have joints of two of the plank come over a supporting column and the joints of the other two at some other place—but just where is one of the

objects of this inquiry. The opinion of practical readers will be greatly appreciated.

Note.—As the spans are only 10½ ft. on centers, why not make each built-up girder that length and butt the joints on the supporting columns? It seems to us this would be the most natural as well as the economical way.

GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION

From T. H. A., Tacoma, Wash.—In reply to the query of "C. G. P.," Newark, N. J., I am sending a drawing showing my method of obtaining the curve on the valley in question. I do not pose as an authority—so please accept this subject to verification by the readers. I assume that it is understood how the horizontal or plan view of the valley is obtained by projection from the front and side views. If the horizontal view is revolved about the point *C* as an axis until it lies in the position *A'-B'-C*, and *A'-B'* is parallel to the front vertical plane, then *A'-B'* will show in its true length and pitch in the front view. Since the curve *B'-C* does not lie parallel to the front vertical plane, it may be projected into the side vertical plane. We then have the three best possible views of the double curve. A large scale drawing should be used.



GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION AS SUGGESTED BY "T. H. A."

MEANING OF SOME LUMBER TERMS

From E. R. N., Bound Brook, N. J.—In glancing over a magazine dated Oct. 21, 1896, I noticed an item relating to lumber which would probably interest many of the readers of the paper, and I therefore quote from it as follows:

"The terms 'comb-grain,' 'edge-grain' and 'vertical-grain' are synonymous in the sense that all of them refer to quarter-sawed lumber, and, as far as my knowledge extends, all of the terms except the first one, comb-grain, are used interchangeably and with no well-defined difference in meaning; but the term 'comb grain' is used to designate only the very best grade of selected quarter-sawed lumber, where the annular rings are nearly or quite at right angles with the face of the board. I am somewhat uncertain as to the extent to which this latter term could be legitimately used, but should think it hardly appropriate for use in describing any but woods having a well-defined grain. Its most common use is in specifications for yellow pine floors. 'Quarter-sawed,' used in specifications, admits of considerable variation in the quality of lumber, but 'comb grain' narrows it down to the very best."

In this connection, an authority states that "the expressions 'quarter-sawed, 'rift-sawed,' 'vertical-grained,' 'straight-grained' and 'edge-grained,' as applied to manufactured wood mean identically the same thing."

WATERPROOFING WALLS AND FLOOR FOR SHOWER BATH

From C. A. H., Cincinnati, Ohio.—Replying to the inquiry of "W. A. W.," West Liberty, Iowa, relative to waterproofing a shower bath room, I take the liberty of suggesting one of the most practical ways of which I have knowledge. This is to use three or four layers of No. 2 tarred felt and lap each sheet 15 in., mopping back the full width of the lap with hot coal tar pitch. Then mop over the top with hot pitch, and after this has cooled, lay the flooring. It will be best to run the felt up the side walls at least 24 in., and, if it is necessary, to waterproof the side walls, use a good grade of one-ply asphalt roofing commonly called Rubberoid, lapping at least 3 in., although a 4-in. lap would be better. Next thoroughly cement all the laps. After waterproofing has been applied, put on the wall surfacing.

This is the only proven method that will absolutely protect the sub-floor and other woodwork, and at the same time withstand such strains as contraction, expansion, and settling of the building. I will be pleased to furnish any further information which the correspondent may desire, if he will kindly make his wants known through the correspondence columns of the paper.

From N. A. Fitch, Youngstown, Ohio.—Referring to the query in the Correspondence Department of the January issue with regard to waterproofing walls and floor of a room to be used as a shower bath, I beg to say that the walls and floor can be made absolutely water-tight by the use of a cement-plaster coat. The mortar should be a 1:2:4 mix and should be waterproofed with a thoroughly reliable integral waterproofing paste or powder using 2 lb. of waterproofing to each 100 lb. of cement. A brush coating of neat cement should be applied to all surfaces before putting on the water-proof plaster. For the walls, the plaster should be applied in two coats of approximately ⅜ in. thick each. The floor should have a coat 1 in. thick, the entire thickness being applied in one operation.

FORMULA FOR MAKING PUTTY

From M. E. H., Spartanburg, N. C.—I am a carpenter and a reader of THE BUILDING AGE and come to the correspondence columns in search of a little information in regard to a formula for making a quality of putty which would be more adhesive than the kind which is now to be found on most local markets. If the fault is not with the putty, I should like some instructions as to how to go about the glazing of old and new sash.

BUILDING A CONCRETE PORCH

From F. W., Savannah, Ga.—I am a subscriber to THE BUILDING AGE and am writing to ask some of the practical readers if they will help me in solving the problem with which I am confronted. I have a porch around my residence measuring 10 ft. in width by 40 ft. in length. It is constructed of No. 1 Georgia pine, but is subjected to the weather and as a result the porch floors soon give way. In order to remedy the difficulty I am now contemplating putting in a concrete porch with cement dressing. If some of those who have had practical experience in connection with concrete work of this nature will help me out of my difficulty I shall be greatly obliged.

DESIGN FOR A WOODEN PORCH TRUSS

From Inquirer, Shreve, Ohio.—Will some of the readers of the BUILDING AGE furnish through the Correspondence Department a design for a wooden porch truss with a clear span of 28 ft.? The depth of the truss over all should be 24 in. The depth of the porch is 10 ft. The roof is to be covered with tin and the ceiling is to be ½-in. yellow pine. I trust that some one will give me a design of truss that will not sag in the center nor buckle sideways.

FINDING LENGTHS AND BEVELS OF RAFTERS

From George H. Wilson, Denver, Col.—Referring to the roof-framing article in a recent issue by "W. G. S." of Phoebus, Va., I desire to say that if he will examine the back numbers of THE BUILDING AGE for July and September, 1913, and November, 1914, he will find this method of obtaining lengths and bevels of all rafters of any design, shape or pitch of a roof fully illustrated and described in my articles on "Roof Framing."

CONSTRUCTING A SELF-SUPPORTING ROOF OF WOOD

From R. L. W., Sturgis, Mich.—Will some of the practical readers furnish sketches for a self-supporting roof built of wood and intended for a garage building 60 x 130 ft. in plan? The walls are to be 10 ft. high and built of concrete blocks. I prefer to have the roof slant to the sides of the building and the water to be taken away inside. The roof covering is to be a four-ply tar and gravel.

NEW YORK'S NEW TELEPHONE EXCHANGE

The financial district of lower Manhattan Island is to have a new telephone exchange in the shape of a sixteen-story structure with frontages of 100 ft. 5 in. on Broad St., 137 ft. 9 in. on Pearl St. and 117 ft. 4 in. on Water St. The plans were prepared by Architects McKenzie, Voorhees & Gmelin, who estimate the cost at $1,200,000; the general contract has been awarded to the Cauldwell-Wingate Co., all of New York City.

ARRANGEMENT OF SLIDING GARAGE DOORS*

THE CURVED TRACK RIGHT ANGLE DOORS CONSIDERED AT THIS TIME—VARIOUS DETAILS

By E. J. G. Phillips

IF there is two feet or more of space between the jamb and side wall, a curved track may be used in the corner as shown in the plans, Fig. 16. There will then be one continuous run of track across the front and around to the side walls. Special knuckle jointed hangers are required to run in this curved track. For single doors, as plan K-1, two short pendant four-wheel hangers are required. On pairs of doors as plan K-2, use a two-wheel hanger on the front end of each door and a four-wheel knuckle jointed hanger on the back end. A stop as detailed in K-3, set on the floor, will hold the front end of a single door in place. Pairs of doors require the guide shown in K-4 in the floor at the center of the opening. To lock from the inside, a floor bolt as shown on the elevation K-1 can be used, but to lock from the outside, a sliding garage door lock should be used at the front side.

A floor guide and track extending from the back jamb around to the side wall and following this as far as the door runs, will be of considerable assistance in guiding the doors as well as in locking them securely. This guide must of course be bent to the same radius as the track and must be located directly underneath it. Flush drop handles should be used on the outside of the doors and bow handles on the inside. Two doors may be hinged together as at K-3 and operated in the same manner. In this way narrower doors can be used and consequently less clearance will be required in turning the corner. A special hinge, however, with one leaf longer than the others should be used as shown in the elevation. This will prevent the door from interfering with the wall in making the turn. Three hangers are required. The pendant of the center hanger should be directly over the edge of the door.

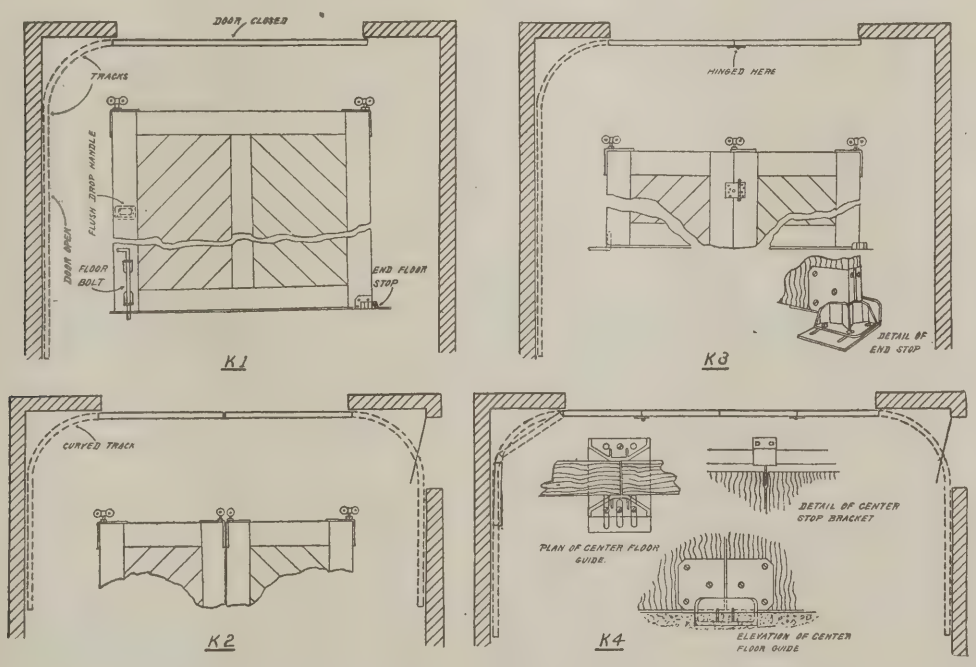


FIG. 16—PARTIAL PLAN VIEWS OF GARAGES SHOWING THE POSITION OF THE CURVED TRACK WITH VARIOUS OTHER DETAILS

This same idea may be carried still further, using four doors to each opening and sliding two each way as in K-4.

When the curved tracks are used, the doors of course will stand farther down the side wall than when straight tracks are used, it being impossible to have the doors stand up in the corner of the building. The dotted lines in the clearance curves previously referred to in connection with straight track right angle doors indicate the clearance required for the doors when using curved track.

An improved method requiring much less front wall space adjoining the opening, is illustrated in

*Continued from page 21, January issue.

the several sketches of the receding garage doors. The minimum distance between the back edge of the door and the side wall is 4½ in., as against 24 in. when using curved tracks. To accomplish this, a special curved corner piece is used, as shown in Fig. 17. This serves as a curved track for the dormer and also as a bracket to support the ends of the two tracks which extend from the ends of the bracket at 90 deg. angles to each other. A reconstructed to set the wheels back over the door farther without changing the distance between the edge of the door and hanger pendants.

An interior elevation of a pair of doors equipped with a complete set of hardware is given in Fig. 19. Always use two handles on each door for moving these doors around the corner. A center stop bracket over the center of the opening stops the doors in the right place and prevents them from

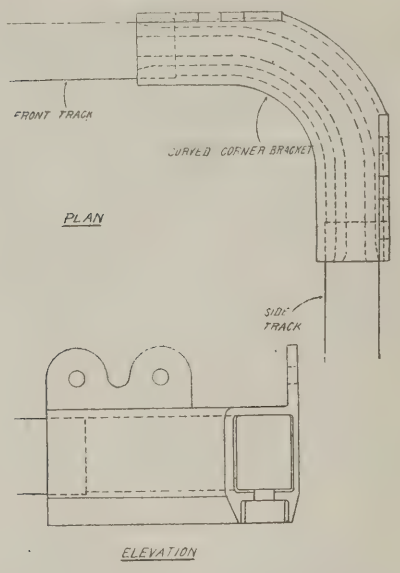


Fig. 17—Plan and Elevation Showing Use of Curved Corner Piece

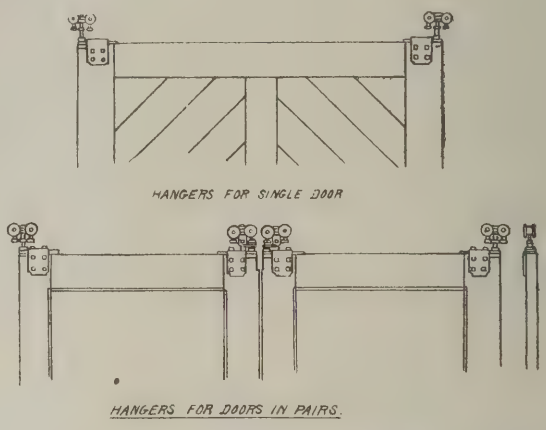


Fig. 18—Details Showing Hangers Applied to Small Doors also Doors in Pairs

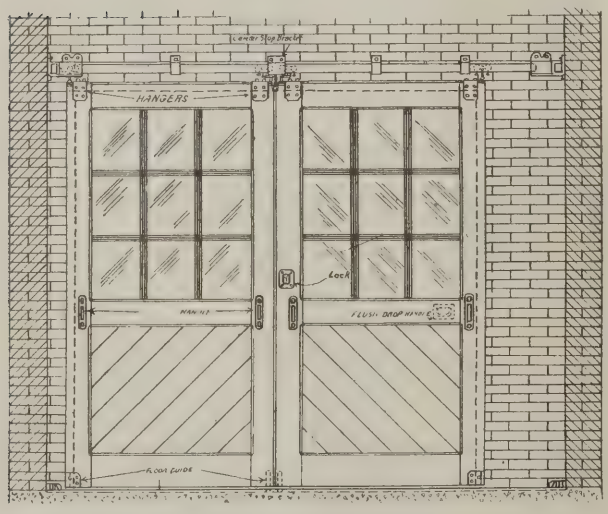


Fig. 19—Inside Elevation of Double Doors Equipped with a Complete Set of Hardware

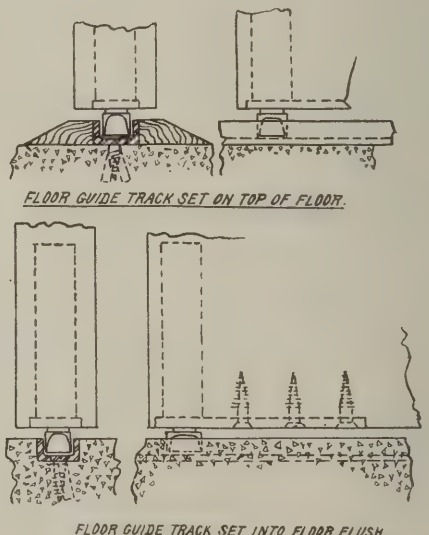


Fig. 20—Various Details of Floor Guides which are Mortised into the Bottom of the Door Directly Under Each Hanger

cessed portion at each end of the bracket just fits the track, and between the ends of the two tracks the bracket itself becomes the track runway. Specially constructed hangers are required to make this short turn, but if the doors are correctly hung, no difficulty will be experienced.

The detail Fig. 18 shows the hangers applied to single doors and doors in pairs. Notice that doors in pairs require a different hanger at the center where the two doors meet. These hangers are constructed to be moved to either side after having been locked together.

The floor guides detailed in Fig. 20 are mortised into the bottom of the door directly under each hanger. These slide in a channel-shaped track which is set into the concrete floor, as shown at the left, or it may be set on top of the floor with beveled strips of wood on each side as at the right. In this case, the floor guide will form a raised threshold, which may in some cases be considered desirable to

prevent rain from beating in under the doors. The floor guide track must, of course, follow the same plan as the door hanger track, and must be directly in line with it. The curved corner corresponds with the curved track brackets in Fig. 21, plan L-5.

The table presented below shows the clearance above the doors required for track and hangers.

Track No.	Size of Track	Weight of Door	Headroom Above Top of Door (Not Opening)	
			Doors in Pairs	Single Doors
31	Small	250 lb.	7" to 7¾"	6⅝" to 7¾"
232	Medium	500 lb.	8¼" to 9⅞"	7¾" to 9⅞"
33	Large	800 lb.	8⅝" to 10¼"	8⅜" to 10¼"

The column headed "Single Doors" also applies to two doors hinged together and sliding in the same direction.

A number of different plans which can be used with this hardware are shown in Fig. 21. The first, L-1, is a single door and the second, L-2, is a pair of doors, one sliding toward the right and the other to the left. Plan L-3 is a pair of doors hinged together and both doors sliding toward the same side of the garage. Three hangers are required, as shown in the elevation L-6. The center hanger should be set forward far enough so the center of the hanger pendant will be over the door joint. A special surface hinge detailed in L-3, one leaf of which is longer than the other, is necessary to provide proper clearance between the doors and wall when turning the corner. The eye of the hinge is located some distance from the joint between the doors. Only two floor guides are used. If the doors are wide, it is preferable not to hinge them together, but to run each door independently. Two hangers will then be required for each door. Plan L-4 is a combination of an ordinary straight sliding door and a pair of doors hinged together sliding to the opposite side. Two doors hinged together sliding toward one side and one door sliding to the opposite side is shown in plan L-5. In the two last mentioned plans, the single door is used as an entrance door. It is then unnecessary to disturb the large opening, when passing in or out of the garage. Two pairs of doors are shown in plan L-6, one pair sliding each way. This opening is similar to plan L-2, excepting that the door would be quite large if only two were used, therefore to save space in turning the corner two smaller doors are hinged

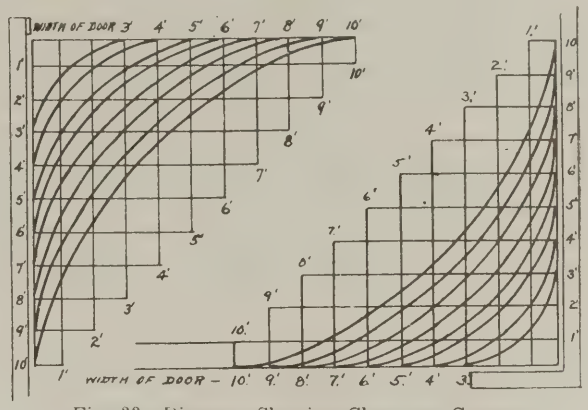


Fig. 22 -Diagram Showing Clearance Curves

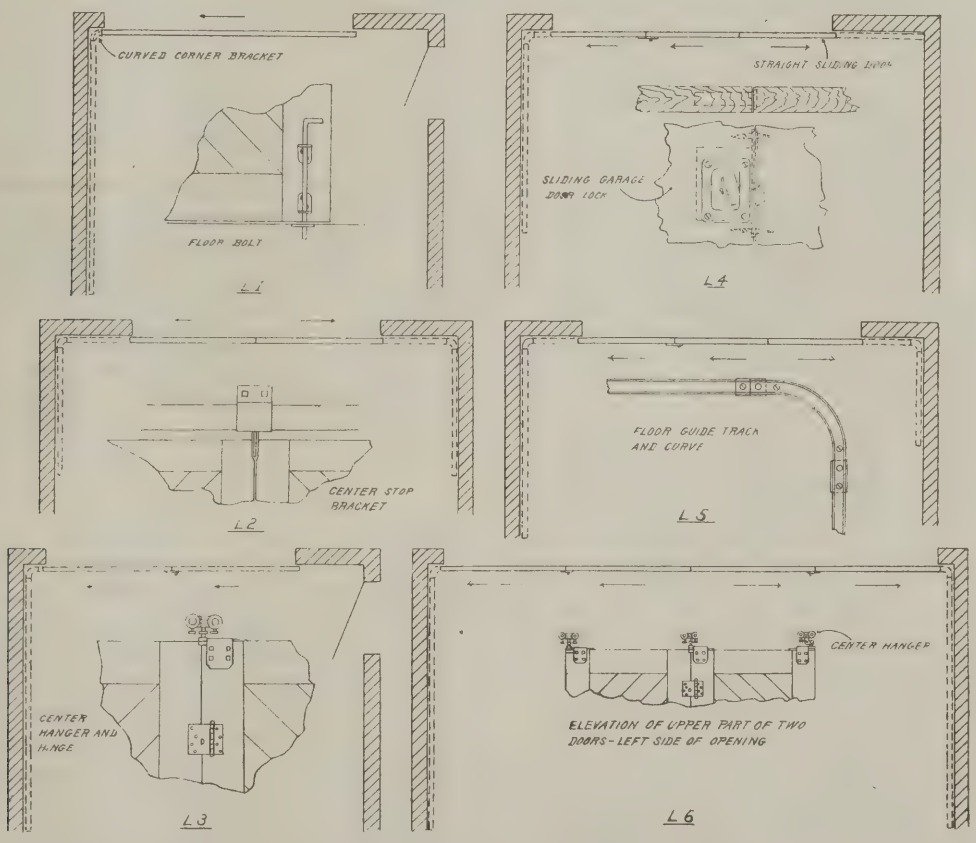


Fig 21—Various Plans which Can Be Used with the Hardware Here Described; also Some Details of Construction

and operated together instead of one large door. The elevation shows the location and number of hangers required.

The clearance curves in Fig. 22 give the amount of space in the garage which the doors require in turning. Notice that the space is always the same from the corner of the building, not from the edge of the opening for a given size door.

This type of door is very simple to lock. If a single door is to be locked from the outside, use a sliding garage door lock in the front stile of the door, but if it is only necessary to lock from the inside, the heavy floor bolt is effective and simple. These are detailed on plans L-4 and L-1 respectively. The same applies to doors hinged together in pairs sliding to one side. Pairs of doors, one right and one left, are locked together at the center and a center-stop track bracket detailed in plant L-2 is used to locate them positively in place.

(To be continued)

CONVENTION OF BUILDERS' EXCHANGES

THE COMING MEETING TO BE HELD IN ATLANTA, GA., LOOMS LARGE IN IMPORTANCE

OFFICIAL announcement has been issued in the shape of a proclamation by President John Trainor and Secretary I. H. Scates, addressed to the officers and members of all associations affiliated and all members at large of the National Association of Builders' Exchanges of the United States of America, that the sixth annual convention will be held in the city of Atlanta, Ga., on February 13, 14 and 15. The headquarters will be at the Hotel Piedmont and the Conference of Secretaries will be held on Monday, February 12. Secretary Scates has recently returned from Atlanta, where he went to arrange details for this coming convention. He learned that the local exchange had prepared a most unique program of events for the interims between business sessions and for the entertainment of the ladies and all this with no interference with the regular order of the convention.

After the close of the convention in Atlanta on Thursday night, a trip has been provided to the Blue Ridge Marble Quarries, said to be the largest in the United States, where a barbecue will be provided by the Quarry Company. On Saturday morning a trip has been planned to Stone Mountain which the people in Atlanta say is the biggest rock in the world, and as Secretary Scates states that Atlanta people never exaggerate anything, it must be so.

At the close of the convention and after having accepted the hospitality of the Friday and Saturday side trips, arrangements have been made for a convention train to leave Atlanta on Sunday morning, the 18th, making the daylight trip to New Orleans, where no hotel accommodations will be necessary, as the Pullman cars have been engaged and will be parked at the station in the city and used during the stay of the delegates there. This insures sleeping accommodations while in New Orleans without the rush and crush at the hotels which is so much a part of the Mardi Gras season in that historic city.

The secretary's office will be located on the first floor of the Piedmont Hotel, Atlanta, and a representative of the railroads will have a desk there to extend information, make all arrangements pertaining to tickets, etc., without annoyance or trouble to the delegates or their party.

Secretary Scates desires to assure members and friends of the Association that every detail of the convention is being cared for in Atlanta, making it only necessary to call attention to the following "dont's," which should be faithfully observed.

Don't fail to notify Dan Carey, Secretary of the Atlanta Builders' Exchange, to secure your hotel reservations.

Don't fail, if you take the matter up direct with the hotel, to send Dan a copy of your letter so that he may see that your wishes are carried out.

Don't delay sending as early as possible your credential certificates to Secretary I. H. Scates, 15 E. Fayette Street, Baltimore, Md.

Don't fail to notify the Transportation Committee of the Convention when you leave your home town and the hour you anticipate reaching Atlanta.

SHIPMENTS OF PORTLAND CEMENT

The shipments of Portland cement from the mills in the United States in 1916 approximated 94,508,000 barrels, compared with 86,891,681 barrels in 1915, an increase of 8.8 per cent; the production of Portland cement approximated 91,194,000 barrels, compared with 85,914,907 barrels in 1915, an increase of 6.1 per cent; the stocks of finished cement fell from 11,781,166 barrels in 1915 to approximately 8,376,000 barrels in 1916, a decrease of 28.9 per cent. These figures are derived from statistics and estimates compiled by Ernest F. Burchard, of the United States Geological Survey, Department of the Interior, and the returns on which they are based were fairly complete for all States except California.

The year 1916 undoubtedly holds the record for shipments of Portland cement; the next highest record was in 1913, when 88,689,377 barrels were shipped from the mills. In production 1913 apparently is still the record year, with an output of 92,079,131 barrels, although there is a possibility that the final returns may give 1916 the lead.

ROWS OF HOUSES HEATED BY FURNACES

SEPARATE FURNACE SYSTEM IN EACH OF 96 DWELLINGS INSTALLED AT MINIMUM COST

BY J. WILMORE

ONE of the oldest cities in which furnace installations have held their own and still successfully compete with other methods of heating is Philadelphia, Pa. It contains 365,000 separate dwellings, which is more than any other city in the country, and rows of new homes are in course of erection in various sections.

The newer residences are moderate cost single-family houses, and the warm-air furnace furnishes the heat for most of them. Several new streets have been opened recently and blocks of houses erected. Usually there are 24 dwellings all in a row and on each side of the street. They are built homes sell for $2,400, including the land. They are reasonably well built, of brick and wood. The floor plan arrangement is the same in the four rows of houses under consideration, and the exterior is also similar, the design being alternated for every group of three houses. Constructon under such conditions is what makes the low selling price possible. The heating contractor had to figure his work accordingly in order to get the contract and thus sizes have been kept down to a workable minimum.

While many furnacemen recommend against the use of warm-air leaders of less than 8 in. diameter,

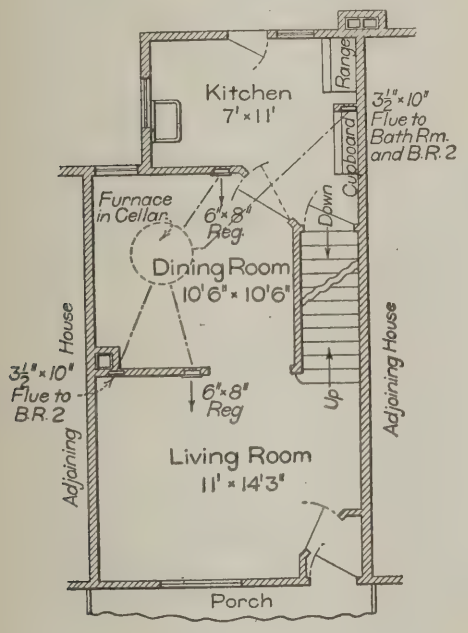
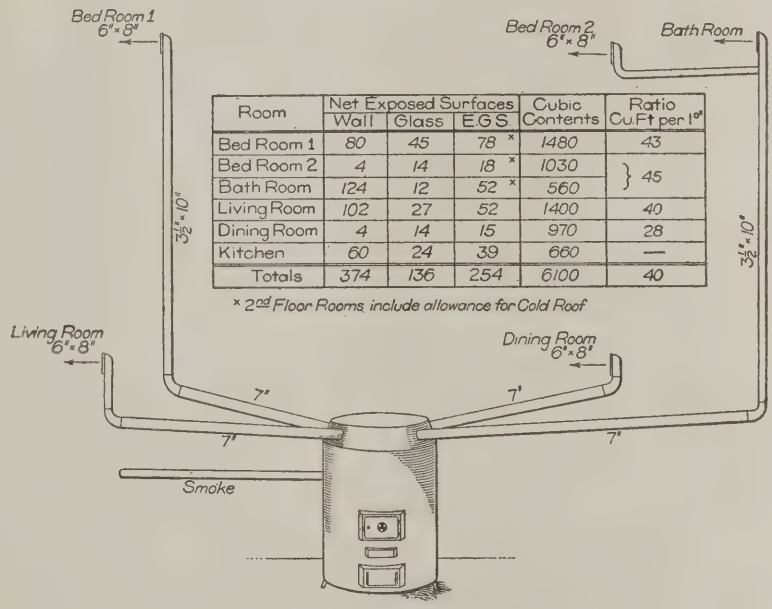


Fig. 1—Plan of Building



Room	Net Exposed Surfaces Wall	Glass	E.G.S.	Cubic Contents	Ratio Cu.Ft per 1°
Bed Room 1	80	45	78 ×	1480	43
Bed Room 2	4	14	18 ×	1030	} 45
Bath Room	124	12	52 ×	560	
Living Room	102	27	52	1400	40
Dining Room	4	14	15	970	28
Kitchen	60	24	39	660	—
Totals	374	136	254	6100	40

× 2nd Floor Rooms include allowance for Cold Roof

Fig. 2—Diagram Showing the Piping System; also a table giving exposed surfaces, cubic contents, etc.

with party walls and so present a solid front, but porch railings and variation in exterior finish with sheet metal bay windows give them the appearance of independent buildings, which they are.

The diagrams herewith are generally typical of many installations and show the warm-air heating system as actually provided in 96 homes in a new development. In corner houses the furnace is larger to take care of the extra wall exposed to the weather. All other houses have but two main exposures, the front and rear, as shown.

Each house is about 15 x 30 ft., two stories high, with cellar but no attic. The floor heights are 8 ft. 7 in. from floor to ceiling. As erected complete with heating, plumbing, gas and electric lighting, the 7-in. leaders have been installed in all these systems. The partition flues are the usual 3½ x 10-in., having an area of 35 sq. in., therefore a 7-in. round pipe with its 38 sq. in. is the proper size to supply the air volume that can be handled by such a riser.

The plan, Fig. 1, shows the arrangement of the rooms on the first floor. The second floor rooms are approximately located in the same way, with the bath room in the rear, and bed room No. 1 over the living room. As shown in the plan the furnace is located in the cellar, practically central in relation to the warm-air flue arrangement. The runs of leaders are indicated by dotted lines in the plan.

In supplying air to the furnace, a window 2 ft. square is provided in a location similar to the win-

dow in the dining room corner. No cold air box is used, the air being admitted directly through the open base of the furnace. There are also other windows in the cellar, and in this way the amount of cold air admitted for the furnace supply, can be well regulated. In severely cold weather all the windows can be shut, or the cold-air inlet just partly opened. With all windows closed, there is still sufficient leakage and air circulation to provide an ample quantity of air to the furnace. Separate smoke flues are provided, two for each house, one is for the furnace and the other for the range in the kitchen, insuring a good draft for each.

For warm-air supply, separate pipes lead to the rising flues and registers except for the rear bed room, as shown in the riser diagram, Fig. 2. A branch, taken from the nearest partition flue, is run to the register in this bed room, a distance of 6 ft. measured in a straight line and it crosses two floor joists. The 7-in. leaders, covered with asbestos, connect to the 3½ x 10-in. flues through transition pieces and are equipped with dampers near the furnace top. The registers are all set in the wall just above the baseboard, and are provided with single damper valves for the regulation of the warm-air supply into each room. Registers of this type have the advantage over flow registers in that no dust or refuse falls into them to retard the flow of air, and are, therefore, more sanitary. The registers in all rooms have a very open face area, which measures 6 x 8 in. inside the border. This gives a free air outlet of about 30 sq. in.

THE FURNACE USED

A Saxon furnace, made by I. A. Sheppard & Co., with a galvanized casing, is used. It has a water pan, a dust damper and a lever operated rolling grate of 15 in. diameter. The total tax on the furnace is the heating of 610 cu. ft. of room space which includes the kitchen. While the kitchen has no register for warm-air supply, some of the heat naturally flows into the space because it is cooler than the other rooms with which it communicates by a double-swinging pantry door, which is usually kept open. A combination coal and gas range is provided in the kitchen, and when a coal fire is burning the room is thoroughly heated.

The combined area of the four warm air leaders is 38 x 4 = 152 sq. in. On this basis 1 sq. in. of leader area supplies an average of 40 cu. ft. of space. By analyzing each room separately, the results as shown in the tabulation with the riser diagram, Fig. 2, are obtained. This gives a range of 28 to 45 cu. ft. of space as being supplied by 1 sq. in. of warm-air pipe. These results point to the fallacy of attempting to proportion pipe sizes on a cubic contents ratio basis. By the ordinary thumb rule using an average of 28 cu. ft. would show that the building requires 210 sq. in. of leader area, which would increase the cost of the furnace system. No two rooms are alike in the wall and glass surfaces exposed to the weather; the cubical contents also being different, that is why the ratios vary. The values for exposure are listed in each case, and this lends itself to comparison. For the second floor rooms, the exposures have been increased by 20 per cent to allow for the cold roof above.

THE EQUIVALENT GLASS SURFACE

It is assumed that 4 sq. ft. of wall loses the same amount of heat as 1 sq. ft. glass, and the reduction is called E. G. S. or equivalent glass surface. Thus bed room No. 1 has a net of 80 sq. ft. exposed wall; this divided by 4 gives 20 sq. ft. E. G. S. and adding 45 sq. ft. glass makes 65 sq. ft. and allowing 20 per cent gives a total of 78 sq. ft. E. G. S., as in the table. The figures listed for the various rooms have been computed in the same way by measuring the glass and walls of the space.

Some assume 80 B.t.u. as the heat loss for 1 sq. ft. of glass when it is zero outside and 70 deg. in the room. Then the total E. G. S. or 254 sq. ft. x 80 gives 20,320 B.t.u. as the total heat loss for the building. According to the rules for figuring warm-air pipe sizes, the leader requirements may be found by dividing the combined B.t.u. losses by 120 for the first floor and 150 for the second floor. Taking an average, this gives heat supply of 135 B.t.u. per square inch of leader area. Then 20,320 B.t.u. divided by 135 gives about 151 sq. in. of leader area as the aggregate required to take care of the building on a heat unit basis. This check on the size of the system shows that the furnace installations under consideration were economically proportioned for adequate heating of the houses. By the thumb rule common in the trade, larger pipes would have been required, and the increased cost might have ruled out the warm-air furnace in favor of another system.

The conditions met in this building, which is typical for 96 recent installations, may be summarized as follows: There are two main exposures to the weather with a total of 254 sq. ft. equivalent glass surface. The computed heat loss is 20,320 B.t.u. and the room contents 6100 cu. ft. This is supplied by a furnace with a 15-in. grate having an area of 176 sq. in. and the heat is delivered through 152 sq. in. of leader area. Thus 1 sq. in. of leader takes care of 40 cu. ft. of space, 1.6 sq. ft. E. G. S., and 134 B.t.u. being supplied by 1.1 sq. in. of grate area. In the same way, 1 sq. in. of furnace grate area heats 34.5 cu. ft. of space through 0.86 sq. in. of leader area which takes care of 1.4 sq. ft. E. G. S. and a heat loss of 116 B.t.u.

PATCHING CONCRETE FLOORS

In regard to the short article recently published in these columns under the above heading, there is apt to be an impression that deep holes and large areas of damaged concrete floors can be patched by using a mastic material such as there described. As a matter of fact, while the mastic mixture is especially applicable to thin patches, say about ⅛ in. thick and for locations where truck loads do not exceed 1½ tons, it is not suited for deep holes nor for large broken areas.

THE USE OF CONCRETE WORK ON THE FARM

CONTRACTORS CAN MAKE GOOD PROFITS IN CONSTRUCTING ALL TYPES OF CONCRETE BUILDINGS

PROGRESSIVE contractors and builders doing business in farming communities have long since been convinced that concrete on the farm has come to stay. The man who years ago confined his activities to foundations and floors is now busily engaged in building complete structures of concrete and specifies this material wherever he can. The farmer is being educated to appreciate the fact that the first cost is not always the most important and that it is essential to have structures that are permanent and require practically nothing for maintenance. There is not a single farm building that cannot be constructed of concrete and steady progress is noted in the use of concrete for farm residences. Numerous opportunities for profitable business await the contractor who will familiarize himself with the many features of concrete as they are suited to the needs of the farmer.

A close study of the requirements for all classes of buildings will soon stamp the contractor as a specialist in this line and his experience will qualify him to make valuable suggestions to his clients. This is the season when the farmer is financially well to do and is thinking of farm improvements. Suggestions are presented in the following pages covering a wide variety of buildings and also miscellaneous work that can be done at a profit. The illustrations and detail drawings are good examples of modern practice and demonstrate the opportunities for business building in the rural districts.

The contractor who will give serious consideration to the value of concrete construction on the farm may rest assured that he can fortify himself with many convincing arguments that will impress the prospective builder. While some farm structures have been built of concrete as cheaply as frame, generally speaking concrete calls for a larger investment. It should be remembered, however, that bad weather does not weaken its construction or appearance, and these features, coupled with the annual economy, effect a saving that practically eliminates any difference in first cost between concrete and frame work.



AN EXCELLENT EXAMPLE OF BARN AND SILOS BUILT OF CONCRETE BLOCKS

Concrete can be used on the farm for residences,

barns, poultry houses, garages, piggeries, stalls and mangers, milk houses, machine sheds, ice houses, silos, all kinds of tanks and troughs, vats and wallows, manure pits, septic tanks, piers and foundations, sidewalls, steps, driveways, hen nests, pump pits, fence posts, etc.



BUILDING A CONCRETE SILO

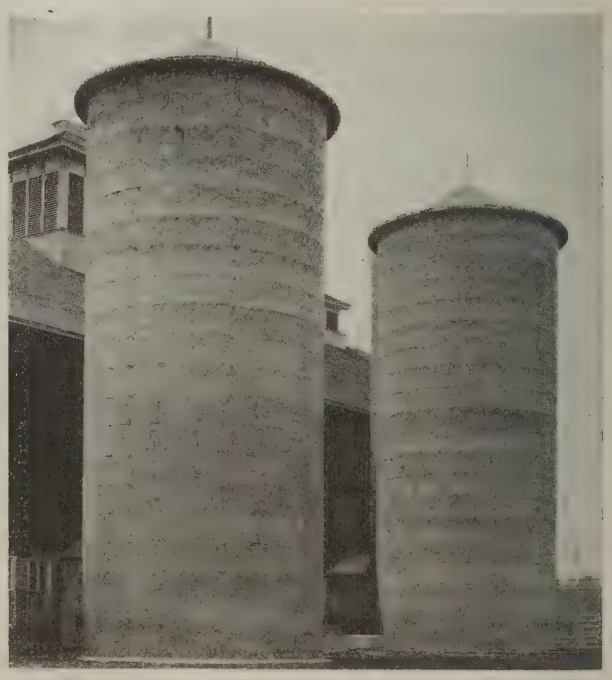
Opportunities are not confined to new buildings, for conditions often exist where structures are in a fair state of preservation and well worth saving. Decaying foundations and faulty floors can be replaced with concrete, while cement plaster or stucco makes an attractive and satisfactory covering in the rejuvenation of old buildings. Lasting results will be obtained where close attention is paid to the aggregate and the materials proportioned accurately.

If one may judge from the demand and the variety of uses to which it is put, the concrete block is the most important of all cement products. When properly made it has not failed to give satisfaction as a building material and much of its popularity has resulted from the pleasing architectural effects that have been brought about. Hollow blocks represent a considerable saving in cost, without reducing the strength so as to impair the safety of the building. The use of facings to bring about pleasing exterior treaments has its advantages while the interior air chambers allow them to conduct heat or cold but slowly. This fact makes buildings of this material warm in winter and cool in summer and tends to prevent sweating of walls.

The curing of blocks is one of the most important points in their manufacture, for carelessness in this process is likely to undo all that has been previously accomplished by careful proportioning, mixing and forming. Concrete block walls may be built without forms, the work being simple and the knack of doing neat and rapid work is not hard to acquire. Residences and garages may be built of these blocks at low cost, being in no sense cheap, having good lines and well adapted to construction on the farm.

Of all the buildings on the farm which should be built of concrete, probably none is more important than the silo. Here is a structure in which it is essential to keep the silage fresh in order that the stock may be kept thrifty and growing all winter. The silo prevents a waste of corn stalks which contain about one-third of the food value of the entire crop, and it enables a large number of animals to be maintained on a given number of acres. The concrete silo is ratproof, windproof, fireproof and will withstand cyclones. It will not dry out in the hot summer months, keeps the silage in perfect condition and can be constructed at a moderate first cost. There are four types of silos—monolithic, cement block, stave and cement plaster construction. It is impossible to lay down a definite plan for the construction of a silo, but the accompanying drawings illustrate a good type of building which can be put up for a moderate sum. In doing the work a good proportion of concrete mixture to use is 1:2½:5 for the foundations and a 1:2½:4 mix for the walls above grade. Capacities vary according to conditions, while the type of construction is largely a question of individual taste. Whichever type is adopted will be found eminently satisfactory and will prove the most economical method of supplying food for the stock. A number of concrete silos in different sections of the country are illustrated herewith.

The ease with which concrete can be kept in a sanitary condition makes its use especially desirable in dairy barns. Concrete floors can be flushed daily in short time and without expense, while concrete stalls and mangers have many features from the standpoint of cleanliness, accessibility, etc. Stanchions always have a solid foundation when installed in concrete and no trouble need ever be feared for their becoming loose. A barn built of concrete can be maintained at an even temperature



TWO SILOS OF SOLID CONCRETE CONSTRUCTION

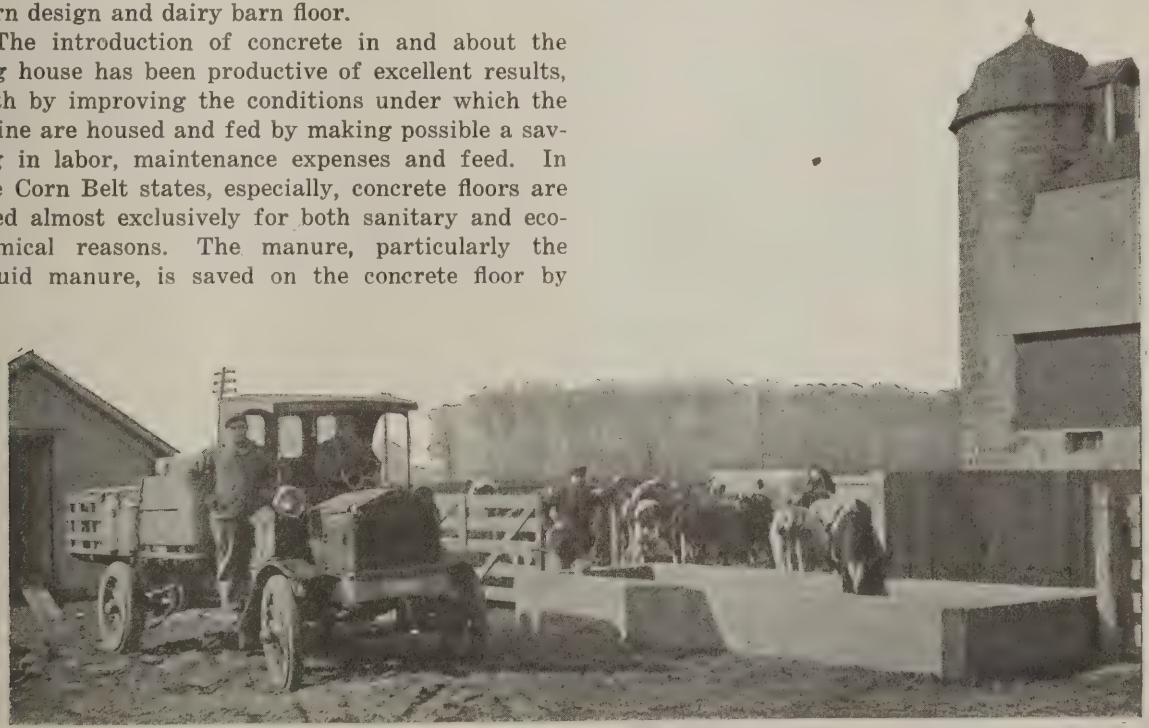


A TYPICAL FARM SCENE—A CONCRETE BARN, SILO AND WATERING TROUGH

throughout all seasons of the year. The concrete hollow block is probably the most commonly used in this work but monolithic walls furred, lathed and plastered on the inside have also given excellent satisfaction. A few years ago even our more progressive farmers were skeptical regarding the practicability of the all-concrete barn, but the fact that many have been constructed and are successful in operation is a conclusive indication of their growing popularity. A particularly fine example of a concrete barn and two large silos built of concrete blocks is reproduced in an accompanying illustration, while details are also presented of a concrete barn design and dairy barn floor.

The introduction of concrete in and about the hog house has been productive of excellent results, both by improving the conditions under which the swine are housed and fed by making possible a saving in labor, maintenance expenses and feed. In the Corn Belt states, especially, concrete floors are used almost exclusively for both sanitary and economical reasons. The manure, particularly the liquid manure, is saved on the concrete floor by bedding, or else through drainage into a gutter and to a manure pit. A concrete floor and barnyard so arranged as to save all of the liquid manure which contains so much valuable fertilizing material was laid by the Ohio Experimental Station some time ago, and a careful comparison made between a herd of cattle kept upon this floor and another herd which was kept on a well packed earth floor, to determine the saving effected by the concrete floor in the value of manure. The saving during the first six months of its use paid two-thirds of the cost of the floor.

Concrete is used successfully for hog troughs and



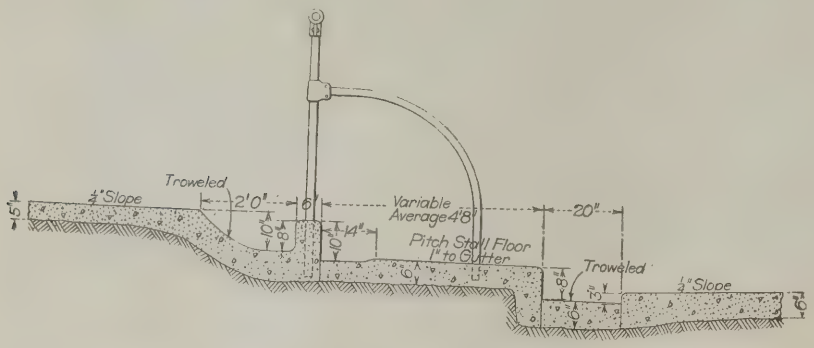
CONCRETE WATERING TROUGH AND HOLLOW TILE SILO ON A MODERN FARM

dipping vats, while it is a good plan to provide a cob burner in connection with a hog feeding floor, to dispose of the cobs which would otherwise litter the floor in the yard. Such a structure protects adjacent buildings from fire and saves the charcoal from the cobs, which is of great value to the hogs.

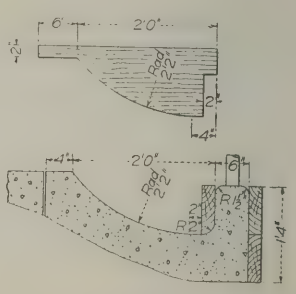
The concrete hog wallow is an improvement which every hog raiser should consider a necessity. The hogs find great satisfaction in being able to lie down in the water, excepting in quite cold weather, and the wallow proves a very practical scheme for killing vermin when a quantity of crude oil or other disinfectant is put in and the intake and outlet stopped. The wallow should be located near the water supply, and it will be found convenient to make the pool rectangular with rounded corners. A concrete floor around the wallow prevents the hogs from burrowing or carrying in mud.

What has been said regarding concrete for piggeries is also true in connection with poultry houses. Concrete buildings contain no crevices in which to harbor vermin, and this freedom from lice makes it possible for the birds to retain more flesh at the end of the setting period and therefore more strength. Poultry can withstand dry cold when housed, but cannot endure dampness or drafts from below, and a concrete floor will also keep out rats. Instances are known where concrete is used successfully for nests, dropping platforms and roosts, thus greatly simplifying the problem of cleaning.

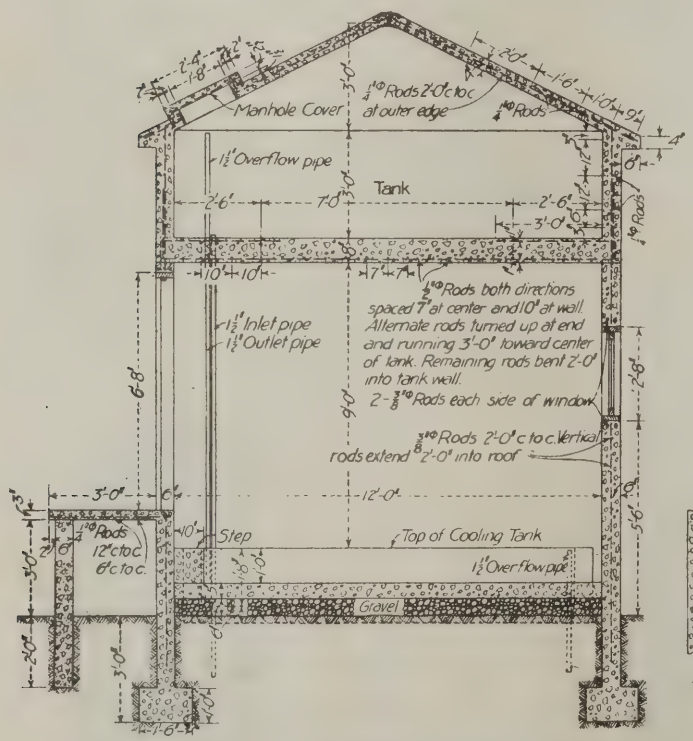
The first requirement of a milk house is that it be scrupulously clean, and the construction should be such as to eliminate breeding places for germs and cracks or crevices for dirt to collect, making cleaning difficult or impossible. A milk house properly constructed of concrete fulfills these requirements, and concrete floors are recommended for sanitary reasons, with proper provisions for draining. The milk house should be located with reference to other buildings, such as stables and manure



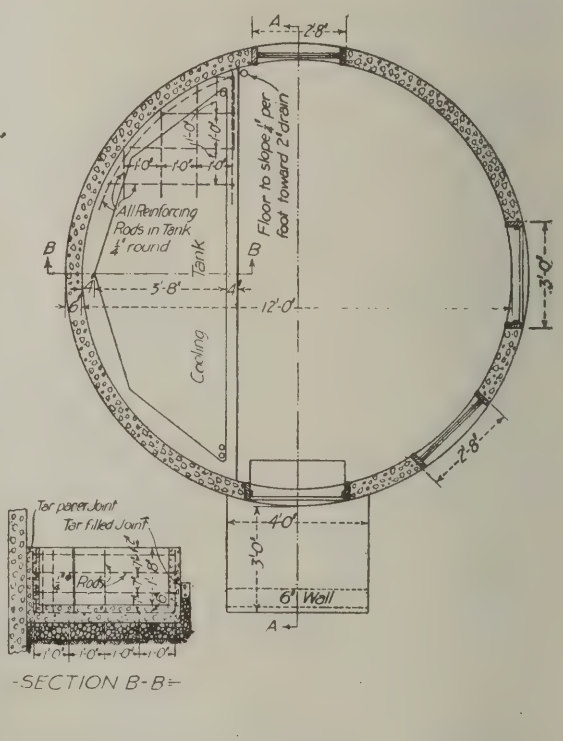
Cross Section through Concrete Manger and Gutter of a Dairy Barn



Details of Template and "Form" for Manger and Gutter



Vertical Cross Section of Ice House on Line A-A of the Plan



Plan of Ice House Scale 3/16 In. to the Foot

DETAILS OF COW STALLS AND MANGER; ALSO OF CONCRETE ICE HOUSE



SHOWING HOW CONCRETE FENCE AND CORNER POSTS MAY BE USED

pits. In the State of New York it is a law that, for certified milk production, milk houses be at least 100 ft. away from such buildings. Cooling tanks and



INTERIOR VIEW OF DAIRY BARN

ice rooms can be planned according to requirements. Accompanying drawings show a modern milk house, complete with tank, a type of work which is simple to construct and will appeal to the farmer who is anxious to have a modern building in which sanitary conditions will be unexcelled. A point of unusual interest to the builder is the proper mix of concrete to use. For the foundations it should be a 1:2½:5, for the walls above grade 1:2½:4 and for the floor and the cooling trough a 1:2:3 mix is used.

With the increased use of gasoline engines and other equipment on the farm, concrete makes an ideal foundation for engines, cream separators, etc. A simple foundation for such work may consist of merely a block of plain concrete, resting on a firm sub-base, with anchor bolts properly set, by means of which the equipment is held in place.

In buildings, such as ice houses, where it is necessary that good insulation against heat be provided, double or hollow wall monolitihic work is often preferred. Double wall work, as the name implies, consists of two entirely separate walls, with an air space between. To construct double walls of the monolithic type a special wall form is required unless the air space is sufficiently wide to accommodate two single wall forms, back to back. For maximum efficiency the hollow blocks should be of the continuous air type and the inner and outer walls tied together with metal ties placed at frequent intervals. The concrete ice house is a good investment and the additional expense over other types of construction will be entirely compensated for during the first few years by the lower cost of upkeep. A good type of concrete ice house is shown in the accompanying design and details of a building where an 8-in. continuous air space block is recommended for use.

Providing a satisfactory storehouse for corn is a live question with every farmer in the corn belt. Experience has proven that corn will keep indefinitely on a concrete floor, if the crib is properly constructed. It will be found advisable to have a concrete foundation in this work, a concrete floor above grade and at least three or four feet of concrete above grade to keep out vermin. Where floors are made crowning or to slope toward the outside, water will drain easily, while a free circulation of air will insure the proper curing of the corn.



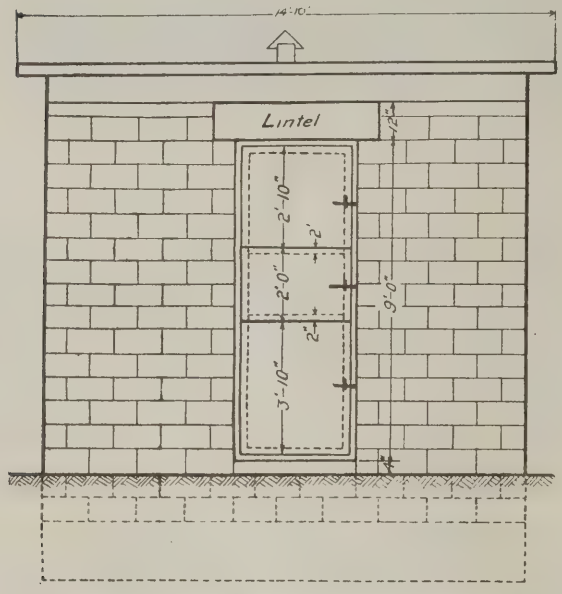
A CONCRETE BLOCK ICE HOUSE

Machinery depreciation on many farms is exceptionally high simply because of the fact that sheds are not provided wherein to house the equipment. If farm implements are kept in a good, dry

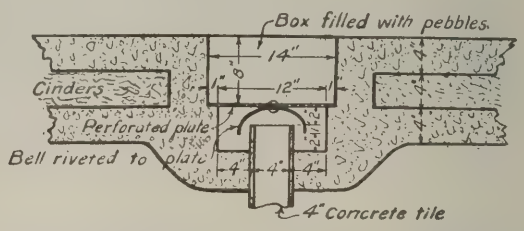
house and otherwise cared for when not in use, their usefulness can be greatly increased. The question of implement and wagon sheds is an important one and they can be designed according to local requirements. The use of concrete in this connection should not be overlooked, as structures of this type are not expensive. It may be found economical to build them of concrete blocks, for the building need not be very high, floor area being the main consideration in laying out the work.

In most of the Northern states root cellars are commonly used for storing potatoes, turnips, and other vegetables from the time of gathering until marketed. Fruits are also stored as well as roots for the winter feeding of cattle. Concrete is used in building these cellars, and they are often constructed below ground level. Concrete is valuable in this instance because it will not rot out and requires no expenditure for repairs.

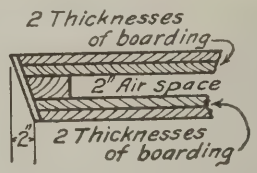
Concrete is an excellent material for building troughs and tanks, in that they are easily built, are permanent, water tight, cheap in first cost, and will not fall to pieces or absorb water. Because of the simple forms required and the ease with which they are constructed in various sizes, rectangular tanks are often preferred, sizes and capacities depending on the amount of stock to be accommodated. Because of its shape a circular tank will resist frost action more perfectly than a tank of any other form, and is the most economical in material for its



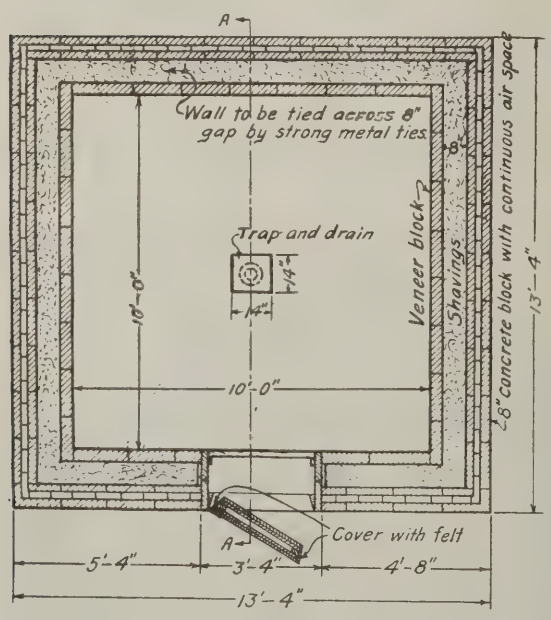
Front Elevation—Scale 3/16 in. to the foot



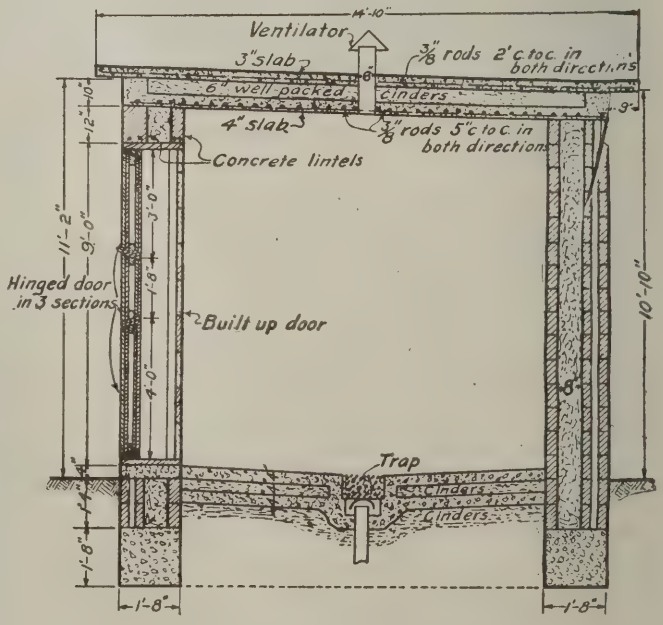
Section through Trap—Scale ½ in. to the foot



Partial Horizontal Section through Door—Scale ¾ in. to the foot



Plan—Scale 3/16 in. to the foot



Vertical Cross Section—Scale 3/16 in. to the foot

PLAN, ELEVATION AND DETAILS OF CONCRETE BLOCK ICE HOUSE

capacity, yet the forms are more difficult to construct and the work is more expensive. The contractor who could induce a number of farmers to use tanks of the same diameter would lessen the



A CONCRETE MANURE PIT

average cost in the use of one set of forms for all receptacles. Concrete tanks have the advantage of sanitation and are easily kept clean, especially where round corners are provided. A smooth surface is desirable on both the inside and outside of tanks and may be obtained by tapping the form as the concrete is deposited, an operation which assists in expelling the air and causes a better distribution of mortar on the surface. Concrete has been found effective in the construction of cisterns, and for purifying water a concrete filter bed in a concrete tank may be used to advantage.



A CONCRETE BLOCK MILK HOUSE

There is no greater menace to the health of a community than the common privy, and the construction of concrete septic tanks is an opportunity that should not be overlooked by the progressive contractor. A septic tank system is a great convenience for the farm residence and in addition also prevents the contamination of water supply. Reinforced tanks are easily and inexpensively built, and one good system installed in a community will pave the way for future business.

Mention should also be made of the value of concrete for waste water receptacles, scale pits, curbing for old wells, pump pits, pergolas, grape arbors and fence posts. There is an exceptionally wide field for concrete fence and corner posts in that they will not rot, burn or corrode, will hold fence wire securely, and will not heave from frost nor pull up easily from line tension when the fence runs across a hollow. No painting is necessary and the posts are permanent. Considerable work of this character can be done when times ordinarily are dull, workmen kept busy and profits made and confidence established with the farmers for future business relations.

In the preparation of this article THE BUILDING AGE wishes to acknowledge the kind co-operation of the Universal Portland Cement Co. in the loaning



CIRCULAR WATERING TROUGH OF CONCRETE

of drawings and several of the photographs reproduced herewith, together with much of the data on the value of concrete on the farm.

CONVENTION OF WISCONSIN MASTER BUILDERS

The fifth annual convention of the Master Builders' Association of Wisconsin was held in Oshkosh, Jan. 11 to 13, inclusive, with about 300 in attendance. Officers were elected as follows:

President...Richard C. Ferge of Milwaukee
Vice-Pres.....Peter Knudson of Racine
Sec.-Field Agt.O. H. Ulbricht of Milwaukee
Treasurer.....H. G. Zickert of Watertown

A resolution was adopted recommending that the legislature enact a law requiring the licensing of all building contractors. It was voted to hold the next convention in Watertown.

The members of the Buffalo Lumber Dealers' Association entertained at dinner on the evening of Jan. 9 about 150 contractors of Buffalo and vicinity. Clark Hurd acted as master of ceremonies and R. J. Summers delivered the principal address, telling what the association has done to bring about more friendly relations among the dealers.

TYPICAL COUNTRY PLUMBING INSTALLATIONS

METHODS OF LAYING TILE AND IRON DRAINS FROM THE HOUSE TO SEWER OR OUTFALL AT SEPTIC TANK

IT is generally admitted that while tile pipe gives satisfactory service in conveying waste matters from the plumbing system of the country house or cottage, as the case may be, to the sewer or point of disposal, it should not be laid inside of the building. The reason for this is that the joints must, of necessity, be made of a material liable to fracture, and settlement of the building walls or of the soil upon which the tile pipe rests may cause the joints or hubs to break, and so permit sewer air to enter the house. Therefore, iron pipe should be used for that part of the drain inside the building, in every instance, and should be carried outside and connected to the tile pipe, if the latter is to be used, at a point at least 6 ft. from the outside wall.

In laying tile drains, special care should be given to the grading of the ditch in which it is to lie. If the run is a long one, the obstruction to the flow of water in the pipe may be sufficient to cause a gradual filling up by sediment deposited as the result of improper flushing, if the grade of the drain is not practically constant. Sudden changes in direction or grade will cause part of the solid matter carried in the flow to be deposited, and in time the deposit may result in a total stoppage.

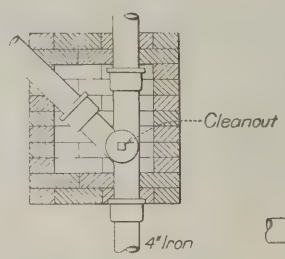


Fig. 1

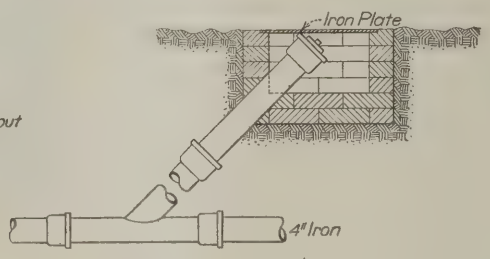


Fig. 2

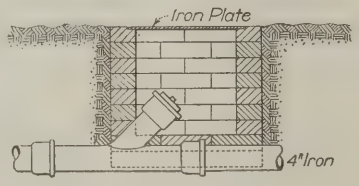


Fig. 3

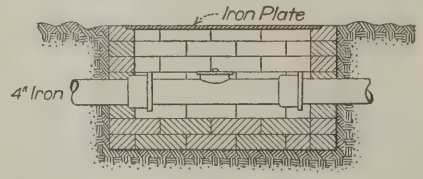


Fig. 4

Fig. 1—Special Y Fitting with Screw Cleanout at Junction. Fig. 2—Cleanout with Extension from Deep Drain. Fig. 3—Cleanout Calked into Y in Brick Pit where Drain is Near Surface. Fig. 4—Special Type of Cleanout for Insertion in Long Lines of Drain Near Surface

Where it is necessary to change direction in a horizontal direction the bends used should be easy, and should never have a radius of less than four diameters of the pipe. Thus, if a 4-in. pipe is used, the bends upon it should have a radius of at least 16 in. Where a change in the grade is made necessary by the contour of the land it may be possible to effect it by the use of pipes which have been slightly bent in process of manufacture. As a rule, these are plentiful enough, and their use will aid considerably in reducing friction and resistance to the flow of water.

The effect of even one right-angle bend on the velocity of flow in a tile drain is considerable, and there is always some danger of deposits building up and eventually causing a stoppage when such are used. Much depends upon the amount of flushing water available in maintaining a satisfactory depth of flow in drains, but it may be said that if it is possible to grade the pipe so that there will be a velocity of some 3 ft. per second in the flow, the pipe will run somewhat over half full, and at that depth the greatest capacity of the drain will be reached. The reason for this is that the friction of the pipe at that depth is less in proportion to the "hydraulic radius" or effective head of water in the pipe than it is when full or less than half full. When a circular pipe is running some four-fifths full, the maximum velocity of flow is obtained, and at the same time solid matters conveyed are submerged and unlikely to cause obstruction by their weight resting on the invert.

To obtain these results it is necessary to secure a grade in 4-in. pipe of 1 in 53, for a 5-in. pipe 1 in 75, and for a 6-in. pipe 1 in 100. These figures are based on pipes of good quality and smooth bore, with joints well made and free from projecting cement.

If it is necessary to lay drains at a gradient much less than these figures they should be as short as can possibly be arranged, so that the velocity with which the discharge enters from the house pipes will in some measure balance the slower flow farther on. The value of a large flush may be overrated unless the gradient is sufficient to maintain a proper velocity of flow in the drain to secure its full advantage.

When a body of water is discharged into a flat drain, the crest of the wave rapidly becomes lower, and, a short distance from the point of entry, it is lost and the flush becomes imperceptible. For these reasons it is desirable to maintain as steady a fall as possible from one end of the drain to the other.

In laying out the line of a drain, if proper instruments are not available an ordinary carpenter's level may be made to serve. It is first necessary to erect

a station at a point over the sewer to which the drain is to be connected, or at the point of outfall. Then, when the level has been set at any convenient height and the bubble of the level is in the center, a sight should be taken to another station set up at a point 50 ft. away in the direction in which

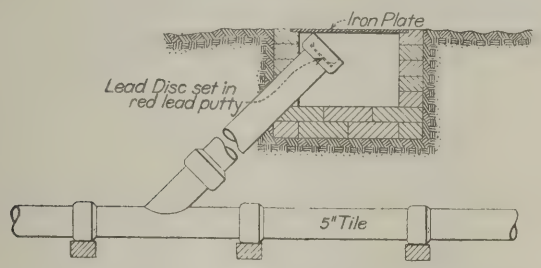


Fig. 5—Cleanout on Tile Pipe with Branch Extended to Surface

the drain is to run. On sighting on the station the necessary pitch is added. Probably 1 ft. will be available in the 50 ft., and this amount should be added to the height at this station. More stations should be set up at intervals along the line of the drain and lined up in accordance with the grade established from station A to station B. When the depth to which the drain must be carried at the sewer or outfall has been determined, the distance below the established grade line at which the sewer or low point lies should be marked on a rod. Then it is easy to grade the bottom of the ditch so that a constant grade is obtained throughout.

In laying tile pipe it is well to lay a number of lengths together and to insert in each of the hubs a strand of rope yarn. This will prevent cement from finding its way into the interior of the pipe. The mortar used should be composed of 2 parts of sand to 3 of Portland cement, and should be freshly mixed as required. If allowed to set and then worked over, it will have a tendency to shrink away from the pipe, and crack on setting. If no oakum is used in the joints, a semi-circular piece of sheet rubber attached to a rod should be inserted, and any loose mortar which may be pushed into the interior removed by drawing this disk to the end of the hub. If the cement is pushed in until the hub is almost filled, and then is allowed to set, the joint may be finished to a bevel with the trowel later, and a satisfactory joint which will prove permanent will result. In order to secure good alignment in the ditch, and so aid the flow of water as much as possible, it is well to stretch a chalk line and lay the pipe according to it.

If the soil in which the drain is laid is loose or wet there may be some risk of settlement, with the certainty that the joints will become leaky in a short time. In such conditions it is well to make some provision for the support of the pipe, and it is common to place under each pipe, at the hub, a brick or stone set in a foundation of concrete, which will offer a greater support than the loose earth packed around the hub on refilling the ditch. It also makes access to the joints easier when the tile is being laid if the hub is kept up from the bottom of the ditch by a support of some kind, although where the bottom is hard, and unlikely to settle at a later time, the tile may lie on the ground solidly and a part be scooped out at each hub.

If the drain is a long one, or if changes in direction are frequent, it is well to provide clean-out openings. The best method of inserting these is to place a Y with the branch fitting looking up, and to carry this branch to a point near the surface, where a shallow brick pit may be prepared and a wood or iron cover placed over it. The end of the branch may be closed with cement or a lead disk set in red-lead putty. The latter is the better way, as it is always possible to remove the disk and to replace it should access to the drain be necessary.

The same provisions that apply to tile-pipe laying apply to iron, but with the latter material the longer lengths make the number of joints fewer, and consequently the drain is, as a rule, more constant in grade and alignment. It is probably unnecessary to say that extra heavy pipe should be used for all underground work and that the joints should be carefully calked. The bends used should be of an easy pattern, and clean-outs should be provided wherever a change of direction is made. If these are placed in manholes, or are carried to the surface, with covers at the upper end of the branch pipe, as already described, access will be easily possible for cleaning when such is required.

Access branches or bends may also be used, and if these are placed in brick-built or concrete manholes they may be, on occasion, convenient for access in clearing the drain of stoppages. Several different arrangements of clean-outs are shown in Figs. 1, 2, 3, 4 and 5.

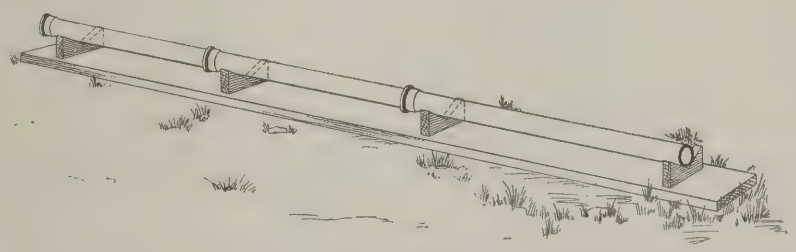


Fig. 6—Convenient Method of Putting Lengths of Iron Pipe Together for Long Drain Lines

When laying long stretches of iron drain pipes it is a good plan to calk several lengths together before they are put into the ditch. In order to do this with the greatest ease a number of blocks of wood cut with a V-shaped notch in them may be nailed on a long plank. If these are arranged as shown in Fig. 6 it is only necessary to place the pipes in position and make sure that the spigot end is firmly laid against the inside end in the hub before the joints are made, to be assured of good alignment. When the three lengths have been calked they can be placed in the ditch, and at the point

where the joint will be made a hand hole should be cut to allow easy access in calking.

If the ditch is wet, and there is any danger of water finding its way into the joint after the oakum has been calked in, but before the lead has been poured, some oil of rosin should be put into the space left by the joint runner. This will be carried into the joint with the lead, and will prevent steam forming, and so blowing the molten lead back and possibly injuring the workman. Alternatively, lead wool can be used in place of molten lead with advantage.

To make sure that no obstruction is formed by oakum being pushed into the pipe at any of the joints in the ditch a candle should be put in through one of the inspection or clean-out openings, and if a mirror is held at the end of the line a view of the entire inner surface will be had.

ARTISTIC EFFECTS IN BRICK WORK

A FEW INTERESTING EXAMPLES WHICH AFFORD SUGGESTIONS FOR THE BUILDER

BY WARFIELD WEBB

THE age of straight lines and severe angles in our architecture has passed. We have come to appreciate the real value of the higher aims in respect to our structural work, and have passed through that period of straight-laced stateliness in architectural designs. In short, we have entered upon an era that demands the highest type in all characters of structures, more particularly that call for notable simplicity. Closer to nature is the one idea that possesses the minds of a larger number of home builders, and of others, too, that desire to get away from the time honored and the commonplace in both structural materials and designs.

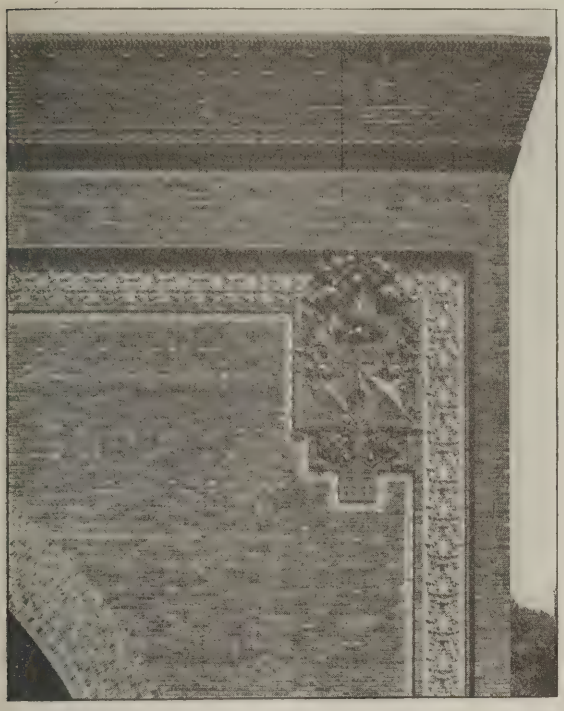


COMBINATION OF BRICK AND HALF TIMBER EFFECTS

Thanks to the true and the beautiful, and to a keener insight into our ideas of building construction, this has undergone changes. While it might be considered to a degree radical as compared with that of another generation, nevertheless it exemplifies the real progress that has been made. In a very special way this applies to the nature and appearance of the materials for exterior wall purposes. We build to-day with a newer idea of the significance of the means and the ends which are only possible with these materials.

In some respects this applies to the use of face brick. The term face brick includes a large variety of styles and colors of burned clay units. Some of these have a certain significance because they have been given names identifying them as individual entities, and have become known by their peculiar title. There has been a change in the whole fabric of the face brick. Styles have undergone certain changes in this material that has made possible the most beautiful effects. There has been a craving for something that bespeaks ruggedness, and has still made possible beautiful effects when used in combinations or in particular designs. This has been made possible and realized in several respects with wire-cut brick, at least in certain types of this style of burned clay. The face of the wire-cut brick is rugged, and the effects, in many cases, are peculiarly attractive. In fact, they gave the appearance of a unique art that is not found in any other material in use. The beautiful effects obtained with these brick in higher art construction work are wonderful. They give one the

impression of an Oriental rug. While this is noticeable in a single brick, it is far greater in a combination of them as used in the hands of the skilled



ORNAMENTAL TREATMENT OF BRICK FRONT OF A CITY BANK BUILDING

bricklayer with an eye to the artistic.

These brick are different in color, texture and appearance from others, and when used in a combination there is a harmonious blending of colors from a light brown to a dark red, chrome, blue and variegated effects that inspire the beholder with wonder and admiration. They take one away from the commonplace and bring him closer to nature; to a recognition of their inmost beauty and to a ruggedness that inspires him with higher and nobler thoughts.

The same can be said to some degree with other bits of burned clay in brick form. In many of these are found a tuneful harmony and a beauty that proves our advance in the right direction, and our love for a higher conception of that which is uplifting in our structural materials. The manufacturers and the architects have united to make possible a keener realization of this much-desired effect. However, it is still in its infancy to a great degree. Some people still cling to the idea that with a pretty and attractive front, there is no need to build the remainder of the structure with materials that will harmonize and make possible the completeness of the whole as naturally becomes a part of the scheme designed to give an artistic effect.

In order to typify the highest in art, we must get closer to nature. In this respect many of us have been and are still lax. In many instances the fault has been with us and not with the materials that we have had with which to build our structures. In ages gone, this fact was fully appreciated by the ancients, and they builded structures with brick many times with the rugged type, and they likewise builded structures that stand to-day as examples of the wisdom they displayed in these undertakings. They sought the beautiful and proved the value of their foresight in monuments they left to endure these centuries that still are the admiration of thousands.

The real value of this bit of burned clay was noted with care by these peoples. The effects of their labors are the living evidences of the esteem in which they were held, and is a greater mark of their intelligence. This is now being understood with a greater degree of appreciative value by the people of the country, and there has been a like increase in the use of this material. We cannot view the brick as a unit, but as a complete whole of many units, and in this way we make possible feats that are wonders of architectural beauty.

So many of us are confounding our ideas of beauty in other ways and are overlooking the great



MAIN FAÇADE SHOWING A GOOD EXAMPLE OF ARCHITECTURAL TREATMENT

possibilities that are at our very doors. There is so much to be gained from the proper conception and from the harmonious handling of the crude

materials in the hands of artists. We suffer ourselves to be carried away with fads that are meaningless and that will only increase our blindness to the things that are about us which possess in themselves the spirit of sincere artistic merit. In the hands of the artist, the rugged brick will become a dream that was not considered possible a few years ago. It is to this end that we must strive, and to this idea that we must key our minds when we think of building, not alone the living abode, but the business structure as well, so that our cities will be less of the hard, straight lines, and more of the artistic ruggedness of nature's handiwork.

SAN FRANCISCO BUILDING CONDITIONS

Our correspondent, writing under date of Jan. 6, says: The record for December as kept by the Chief Inspector of the Board of Public Works compares not unfavorably with recent months. The classification of work undertaken shows about how things have been going of late, with the emphasis on small work. There were only three Class A buildings, valued at $234,750; six Class B, total $449,000, and eight Class C, averaging $10,000 each. New wooden buildings totaled $413,718, being 112 in number, and alterations numbered 375.

The record for 1916 as a whole shows some gain over 1915, but a heavy drop from the years immediately preceding, the two past years being the smallest since 1905. An analysis of the 1916 record shows 24 Class A buildings, valued at $3,108,535; the same number of Class B, valued at $1,545,742, and 148 Class C, valued at $2,928,937. Frame buildings numbered 1787, with a value of $6,561,000. Fourteen harbor buildings were erected, valued at $341,462, and two state buildings, $298,181; while 29 public buildings totaled $2,041,343.

The outlook for spring is considered most encouraging. While speculative building is not stimulated by present conditions, builders have become largely accustomed to the present range of prices, and many plans are now about ready to be let. The architects have been busy for many months and are still well occupied, having quite a number of really important Class A projects. Prospects for renewed activity in home building are unusually favorable.

Steel continues to lead as to strength of price, among the larger staples, though it is far outdone by many items in hardware, plumbing goods, etc., in which brass and other metals figure largely. Following the heavy advances on structural shapes, plates, brass, sheets, etc., Jan. 1 brought a rise of $2 per ton in freight from Eastern mills. Local mills seem to be getting the bulk of the reinforcing bar business, which has been quite active; though some are still brought from some interior points. The mills are quoting rather low prices on large lots for distant delivery, but stiff figures are asked for prompt delivery. Despite the absence of large contracts, steel fabricators are fairly busy.

While cement remains steady, other materials entering into concrete are decidedly easy as to value on both sides of the bay, as some of the quarry concerns have found their output in excess of requirements and have been shading prices. Brick dealers report an increase of 10 per cent in the amount of brick used in San Francisco and vicinity for 1916 over the year before, and the market has remained steady as to value throughout the season, the situation being much more satisfactory than a few years ago. Terra cotta, etc., was unreasonably low here for a long time, and has recently advanced slightly, with prospects that the new prices will hold. Efforts are being made to extend the San Francisco standard size for common brick to all parts of the State, where there is confusion in sizes.

All kinds of lumber were in exceptionally strong demand around the turn of the year, and the movement keeps up well, most orders being for about 60 days' delivery, and covering both particular jobs and yard stocks. The car shortage continues, embarrassing the local consuming market as well as those of the Middle West, and buyers are disposed to place orders well in advance. Redwood has been marked up $1 per M locally.

The California redwood manufacturers are raising a fund of $15,000, and the yellow and white pine manufacturers a similar sum, as their share of the fund for National lumber advertising.

A large lumber mill company of Portland, Ore., is preparing to build a special plant for the manufacture of portable houses in knock-down form. The output will be intended especially for export, as there is a growing demand for this form of building in countries bordering on the Pacific Ocean, as well as in Europe.

NEW OFFICERS OF IOWA MASTER BUILDERS' ASSOCIATION

At the two-day meeting of the Master Builders' Association, held at Des Moines, Iowa, January 16 and 17, the following officers were chosen to serve for the ensuing year:

President...J. C. Loomis of Cedar Rapids
Vice President.A. A. Arnold of Davenport
Secretary....C. E. Larson of Fort Dodge
Treasurer..J. A. Benson of Des Moines

C. P. Massard of Des Moines was made permanent secretary of the organization.

MASTER BUILDERS' ASSOCIATION OF NEBRASKA

At the second annual convention of the Master Builders' Association of Nebraska, held at Omaha, January 9 and 10, the following officers were chosen for the ensuing year:

President.....Grant Parsons of Omaha
Secretary.....V. R. Gould of Omaha
Treasurer.....E. Rakahr of Lincoln

Several directors were elected and after an interesting program of business had been considered the sessions concluded with a banquet.

NEW BUILDING CONSTRUCTION IN 1916

BUILDING OPERATIONS IN 117 CITIES SHOW INCREASE OF 23 PER CENT OVER 1915

WE take pleasure in presenting at this time figures affording an excellent idea of the new construction work planned in leading cities of the country during the year just closed in comparison with the estimated cost of improvements for which permits were issued in the twelve months of 1915. Reports from 117 cities show that the estimated cost of new construction work last year was $924,787,875 as contrasted with $751,914,079 in the twelve months of the year before, or a gain of 22.99 per cent. For convenience in comparison we have divided the country into four sections or zones, namely, East, Middle, Southern and Western. From the Eastern section we have reports from 44 cities, of which 33 show an increase and 11 a decrease, but with a resultant gain for the year over 1915 of 19.32 per cent. The accompanying table shows at a glance the relative activity in the cities reporting.

CITIES OF EASTERN STATES

	1916	1915
Allentown	$2,178,585	$1,477,335
Atlantic City	1,891,333	2,144,215
Bayonne	1,382,225	1,016,556
Beverley	588,195	429,988
Binghamton	1,927,948	1,519,007
Boston and suburbs	64,297,000	63,901,000
Bridgeton, N. J.	275,000	240,000
Buffalo	13,137,000	11,798,392
Elizabeth	2,301,632	1,362,988
Erie	2,800,191	2,054,296
Harrisburg	1,830,923	1,428,950
Hartford	7,383,163	5,575,895
Haverhill	1,148,950	1,402,000
Hoboken	1,789,750	802,060
Holyoke	1,297,070	934,505
Lowell	1,195,454	852,950
Manchester	1,448,129	2,598,055
Newark	9,486,775	7,912,184
New Bedford	4,762,081	3,126,734
New Britain	1,565,425	1,480,785
New Haven	5,022,546	7,104,947
New London	1,950,255	937,600
New York:		
Manhattan	134,078,044	73,672,674
Bronx	18,425,060	29,351,126
Brooklyn	42,163,505	45,601,851
Passaic	1,420,008	1,074,332
Paterson	2,338,796	1,693,881
Philadelphia	49,896,570	39,441,125
Pittsfield	1,356,920	697,423
Pittsburgh	13,554,810	14,404,486
Quincy	2,171,828	1,169,450
Reading	1,401,725	1,012,100
Rochester	9,379,447	9,108,333
Schenectady	1,780,254	1,550,030
Scranton	1,455,174	1,683,391
Springfield	7,104,112	6,066,394
Stamford	1,228,685	980,091
Syracuse	4,294,851	4,663,216
Trenton	2,256,156	2,600,861
Utica	1,834,175	2,137,020
Wilkes-Barre	1,213,605	1,076,800
Woonsocket	732,725	548,246
Yonkers	2,213,100	1,943,400
York, Pa.	665,639	326,515

In the central or middle states the activity was greater than in the East, reports from 37 cities showing only 5 in which there was a falling off in new construction as compared with the year before, while 32 show an increase with a resultant gain of 26.45 per cent. Here notable increases are found in Chicago, Akron, Detroit, Duluth, Milwaukee, Omaha, St. Louis, Toledo and Indianapolis.

CITIES IN MIDDLE STATES

	1916	1915
Akron	$12,823,536	$6,030,950
Canton	4,328,555	2,005,190
Cedar Rapids	1,784,000	1,761,000
Chicago	112,835,150	97,291,480
Cincinnati	10,842,895	14,025,833
Cleveland	33,108,260	32,660,305
Columbus	7,194,240	4,928,425
Council Bluffs	765,650	304,981

CITIES IN MIDDLE STATES (Continued)

Davenport	1,017,395	922,498
Dayton	3,734,346	2,254,862
Des Moines	3,387,897	1,873,616
Detroit	51,067,110	32,235,550
Duluth	10,223,598	2,714,464
East St. Louis	795,496	1,253,257
Fort Wayne	3,479,531	2,009,415
Grand Rapids	3,519,245	2,684,037
Indianapolis	8,935,039	7,093,642
Kansas City, Kan.	748,430	963,249
Kansas City, Mo.	11,563,444	10,667,405
Lincoln	1,939,916	1,706,049
Massillon, Ohio	239,370	184,725
Milwaukee	15,003,846	12,472,603
Minneapolis	22,909,290	16,349,940
Omaha	7,190,000	5,385,005
Peoria	2,135,979	1,875,261
St. Joseph	893,945	952,745
St. Louis	15,444,103	11,439,320
St. Paul	11,128,632	11,942,531
Sioux City	3,090,305	2,050,417
South Bend	1,396,501	816,538
Springfield, Ill.	2,125,337	1,194,818
Superior	1,400,929	919,825
Terre Haute	850,570	632,396
Toledo	9,747,454	7,622,244
Topeka	808,865	768,181
Wichita, Kan.	1,969,000	964,695
Youngstown	3,400,079	2,573,555

In the South the showing is also gratifying, the figures from 19 cities reporting indicate a loss in only 6 with a gain in 13 and a resultant increase over the year before of 24.57 per cent. The table presented herewith shows the estimated cost of the building improvements in the different cities reporting for which permits were filed.

CITIES IN SOUTHERN STATES

	1916	1915
Atlanta	$3,685,663	$4,589,214
Baltimore	10,102,870	7,318,059
Beaumont	1,009,814	685,396
Charlotte	837,039	1,215,466
Columbia, S. C.	228,141	360,531
Dallas, Tex.	4,293,464	3,422,512
Fort Worth	2,127,199	1,166,907
Jacksonville	1,558,924	1,658,158
Houston	3,086,871	2,418,803
Huntington	1,532,600	1,442,695
Memphis	3,091,970	2,730,488
Monroe, La.	146,225	129,875
Norfolk, Va.	2,699,623	1,865,928
Oklahoma City	2,712,988	1,166,806
San Antonio	2,283,638	1,761,860
Savannah	1,245,993	1,430,445
Tampa	1,290,828	1,395,409
Wilmington, Del.	2,788,028	1,524,852
Wilmington, N. C.	918,200	352,900

Coming now to the extreme Western section of the country, out of 17 cities reporting only 2 show lessened activity as compared with 1915, and the result is an increase of 27.24 per cent.

CITIES IN EXTREME WESTERN STATES

	1916	1915
Albuquerque	$303,555	$273,667
Berkeley, Cal.	1,747,223	1,944,525
Boise, Idaho	179,000	143,000
Colorado Springs	460,656	184,722
Denver	4,038,840	2,648,575
Los Angeles	15,036,045	11,888,662
Missoula, Mont.	194,500	132,800
Oakland	5,368,290	5,045,289
Pasadena	1,624,647	1,494,349
Sacramento	2,106,458	1,395,578
San Diego	1,869,399	1,285,982
San Francisco	18,837,173	13,990,704
San Jose	865,741	558,910
Seattle	8,304,689	6,470,655
Spokane	1,002,667	1,586,787
Stockton	1,138,174	1,019,452
Tacoma	1,617,981	780,424

It is fair to assume that much of the work for which plans were filed in the later months of 1916 will not be commenced before settled weather in the spring, and the outlook for a gratifying degree of activity in all branches of the building industry is of a most encouraging nature.

New Publications

Low Cost Suburban Homes. Edited by Richardson Wright. 120 pages, size 7¼ x 10½. Illustrated. Bound in cloth. Published by Robert McBride & Company. Price $1.25.

The popularity of the small, low-cost home renders any addition to the literature thereon of more than usual interest to the builder, for he himself is constantly being called upon to plan and erect such dwellings. Both exterior and interior views, as well as the plans, are of value to him and the book under review contains interesting material along these lines. The illustrations are all diverse as to the character of the houses pictured, and the dwellings are said to have all been constructed at a cost under $10,000 each.

The text is the work of various architects, each of whom contributes his ideas upon some particular phase. Of special interest is the chapter on "How to Go About Planning Your Home." Here, different ways of meeting the same problems are discussed and illustrated. Another valuable chapter is that entitled "The Cost of Different Kinds of Building," in which are given compartive estimates for various materials used in the construction of the same house. Then these original costs and the upkeep expense for fifteen years are figured together and compared, giving a most excellent idea of both original and ultimate costs.

How to Make the Business Pay. By Edwin L. Seabrook. 173 pages. Size 6 x 9 in. Illustrated with diagrams and forms. Bound in cloth. Published by The Sheet Metal Publication Company. Price $2.

A knowledge of efficient business methods is of as much financial value to the progressive builder as economical construction, and the one connotes the other in the career of the successful builder of to-day. One of the best ways in which a knowledge of business methods may be gained is by a study of the means employed by others engaged in the same trade. The author of the book under review has based his remarks upon such an actual foundation, and as he has visited several thousand firms located in all parts of the country, carefully studying their business conduct, he has been able to gain a wide range of experience. His activities with a large national trade organization, and his long experience in the sheet metal business, have peculiarly fitted him to present valuable business ideas to those engaged in the building trades.

Although the builder may estimate his work accurately, and leave a calculated margin for profit, yet many little expense items may enter into his business without his realizing it, and the profit may be appreciably cut down, or even eliminated by them.

The chapter on "Estimating" gives valuable practical ideas along these lines, as it deals with various phases of estimating and price making—estimates that won actual contracts being used to illustrate correct and incorrect methods. These methods are analyzed, and from them are deduced the profitable and unprofitable methods of estimating.

The chapter on the "Cost of Conducting Business" is equally practical, for the figures of a real business are taken, and from them is explained how the cost of doing business is ascertained. The chapter on "Bookkeeping" shows how to keep track of the business, and the actual transactions of a month's business are shown and explained as entered in the day book, journal, cash book, and ledger, in both single and double entry.

Some of the other subjects upon which valuable ideas are contributed are efficient collection methods, correspondence, securing customers, and publicity. The book is one which every progressive and wide-awake builder doing a growing business should have in his library of trade literature for study and reference when necessary.

The Nelson Form for Choosing Bidders and Awarding Contracts. By H. W. Nelson. 86 pages, size 3¾ x 6 in. Bound in paper covers. Published by Glen Smith, Moline, Ill. Price 50c.

This little work on the subjects indicated has been brought out at the solicitation of contractors in Iowa and the matter has been prepared by a man who for over twenty years has been closely allied with contracting, his father having been a contractor before him. For many years past he has carefully studied competitive methods employed in this country in connection with building work and the result of this is the "form" here described. In connection with it rules and methods of procedure are given. The "Form" for Choosing Bidders and Awarding Contracts is presented for the consideration of architects, contracting builders, engineers and in fact all interested in awarding or procuring contracts for furnishing material or service under competitive bidding.

The new telephone building in course of erection in Providence, R. I., is expected to be completed some time the coming fall. It was designed by Clark & Howe, architects of that city, is eight stories high, the first two of which will be in white Vermont marble and above these red brick will be used with white marble sills and heads for the windows. The contractors are Charles B. Maguire Company of Providence.

William H. Smith, a well-known contractor and builder of Johnstown, Pa., recently died at his home in that city. He was born in 1849, and as head of the firm of W. H. Smith & Bro. was prominent in the rebuilding of Johnstown after the flood of 1889. The firm name was changed to W. H. Smith & Sons in 1911. A number of important buildings in the city stand to his credit.

CURRENT NEWS OF BUILDERS' EXCHANGES

VARIED HAPPENINGS OF INTEREST TO BUILDERS IN DIFFERENT PARTS OF THE COUNTRY

Annual Meeting and Election of Officers of Cleveland Exchange

A LARGE attendance of members characterized the annual dinner and meeting of The Builders' Exchange of Cleveland, Ohio, recently held in the new Exchange assembly room in the Rose Building. The Exchange had as guests on this occasion the presidents of nine other business associations of the city. On account of the absence of other officers from the city, the Chamber of Commerce was represented by Secy. Munson Havens, who extended congratulations on the new quarters and other evidences of prosperity of the Exchange.

In his annual address the president of the Exchange, Arch C. Klumph, called attention to the splendid growth of Cleveland as evidenced by the increasing volume of building operations and then reviewed the prominent events of the record of the Exchange for the past year as well as outlined some interesting plans for the future.

The annual election of directors occurred during the day and resulted in the selection of the following:

E. M. Carleton, Mills-Carleton Co., Lumber.

George Donley, Donley Brothers, Iron & Steel.

Sam W. Emerson, Sam W. Emerson, General Contractors.

John Jaster, Jr., Uhl-Jaster Co., Carpenter Contractors.

C. W. Lundoff, Crowell-Lundoff-Little Co., General Contractors.

Karl H. Pratt, Bolton-Pratt Co., Reinforced Concrete Work.

A. E. Riester, Riester & Thesmacher, Sheet Metal Contractors.

Frank S. Sheets, Sheets Elevator Co., Builders' Supplies.

F. A. Skeel, F. A. Skeel & Co., Carpenter Contractors.

F. D. Watts, The F. D. Watts Co., Plastering Contractors.

The new board organized by electing the following officers:

President.....Sam W. Emerson
Vice-President.....C. W. Lumdoff
Treasurer.....George Donley
Secretary.....Edward A. Roberts

A booklet issued by the Exchange contains a description of the new quarters as well as a picture of the building in which they are located.

Convention Trip of Detroit Builders' Exchange

In a recent issue of the *Bi-Monthly Magazine* published by the Builders' and Traders' Exchange of Detroit, Mich., there appeared a most interesting account of the trip which the Exchange has arranged for attending the national convention at Atlanta, Ga., in February, and then going on to New Orleans in season to be present at the great festival of Mardi Gras. According to the program outlined, the proposed trip is to cover several points of interest in addition to Atlanta and will occupy about two weeks from the time of leaving until the return. The itinerary calls for the delegates to leave Detroit Saturday evening, Feb. 10, and reach Atlanta Tuesday, Feb. 13, stopping *en route* at Louisville, where the entire party will visit Mammoth Cave, and Chattanooga, where historic points of interest will be visited as well as the Industrial Exhibit showing samples of everything made in the city of Chattanooga and said to be one of the most complete in the United States.

After attending the sessions of the convention in Atlanta, the party will go on to New Orleans, visiting Montgomery and Pensacola on the way. The party will visit Bogalusa, where they will be the guests for the day of the Great Southern Lumber Company in its lumber-milling camp, which is said to be the largest in the South. The party will spend Feb. 18, 19 and 20 in New Orleans, leaving that city early Feb. 21 for Detroit, stopping at various points *en route*.

The issue of the magazine in question carries a brief report of the fourth annual convention of the Associated Builders' Exchanges of Michigan recently held in Lansing; also an account of the Detroit Exchange's outing at Lakeside, near Mount Clemens.

Buffalo Exchange Elects New Officers

At the annual meeting of the Builders' Association Exchange of Buffalo, N. Y., held on Jan. 9, the following officers were elected for the ensuing year:

President.....Ed D. McCarthy.
Vice-president.....Walter W. Wade.
Treasurer.....Henry Schaefer.

Frank Farrar, who is at present acting as secretary, will probably be reappointed to that office. The new officers were to be installed the latter part of the month.

The Board of Directors recently decided to send two delegates to represent the Buffalo Exchange at the annual meeting of the National Association of Builders' Exchanges of America, to be held in February in Atlanta, Ga.

Banquet of Pittsburgh Builders' Exchange

The members of the Builders' Exchange of Pittsburgh, Pa., enjoyed the seventh annual banquet of that organization which was held in the William Penn Hotel on the evening of Dec. 14. The architects of the city had been invited as guests of the Master Builders, and they were seated at specially reserved tables in the center of the room. Souvenirs were distributed at all plates and when not singing the popular songs, and while waiting for the various courses, the guests amused themselves by sailing toy balloons, blowing souvenir whistles and laying away other souvenirs presented by various concerns.

Henry J. Harder was toastmaster of the evening and his repartee as well as his stories in English and dialect were keenly enjoyed. Among the speakers of the evening were Dr. Arthur A. Hamerschlag, director of the Carnegie Institute of Technology, who spoke on "The Builders—a New Profession," and James A. Wakefield, whose address on "Hawaii" was both interesting and instructive as he told of many things about the little island, which have been heard of in song and story. George H. Nielsen gave a humorous talk which kept his hearers in convulsions of laughter. He also had something to say on "The Mexican Situation." Previous to the vaudeville performance there was a prize drawing of a bath shower, donated by Weldon & Kelly Company. Tickets had previously been distributed at each plate and the one holding the lucky

number secured the prize. The winner was J. H. Dumbell of Samuel McKnight Hardware Company. The consolation prize—an imitation policeman—was won by R. K. Cochrane.

Members of the "Atlanta Club" of the Pittsburgh Exchange were conspicuous at the banquet, each member of the club wearing a badge of orange with black printing and bearing the words, "I am going to Atlanta, are you?" It is expected that quite a number will go from Pittsburgh to attend the National Convention to be held in the Southern city in February.

New Officers of Minneapolis Builders' Exchange

At the annual meeting of the Builders' Exchange of Minneapolis, Minn., held Jan. 9, officers for the ensuing year were elected as follows:

President.....W. I. Gray
1st Vice-president.....James H. Brown
2nd Vice-president.....James R. Ralph
Treasurer.....C. F. Splady
Sergeant-at-arms.....George Leighton

Three members were elected to the Board of Directors and a Committee on Complaints composed of five members was appointed.

Annual Meeting of Toledo Builders' Exchange

The annual meeting of the Builders' Exchange of the city of Toledo, Ohio, was held on the first Tuesday in January at which the following officials were chosen for the ensuing year:

President.....S. S. Walls
1st Vice-president.....O. W. Kirschenbauer
2nd Vice-president.....B. C. Root
Secretary.....W. J. Albrecht

A Board of Directors consisting of six members was elected and committees were appointed on Finance, Arbitration, Membership and Rooms.

A Builders' Exchange at Alliance

The leading builders of Alliance, Ohio, recently decided to organize a Builders' Exchange in that city and final steps were taken at a meeting held in the City Hall at which time thirty representatives of the various branches of the trade were present. Officers were elected as follows to serve for the ensuing year:

President.....J. F. Sharp
Vice-President.....E. B. Silver
Secretary.....J. Y. Gamble
Treasurer.....J. O. Ellis

A committee consisting of C. C. Mummert, J. Y. Gamble and L. W. Harland was appointed to formulate a constitution and by-laws.

Annual Meeting of Grand Rapids Builders Exchange

The annual meeting of the Builders and Traders Exchange of Grand Rapids, Mich., was held on Jan. 9, and officers for the ensuing year were elected as follows:

President.....G. A. Richards
Vice-President.....L. P. Oltman
Secretary.....A. H. Shank
Treasurer.....C. G. Kuennen

President Richards reviewed the progress of the organization during the past year and made several recommendations tending to result in a stronger organization. Secretary A. H. Shank, in his report, stated that the Exchange now numbers 187 members, there having been a gain of 30 during the past year, and that the financial gain has also been satisfactory.

Master Builders' Association of Seattle

The Master Builders' Association of Seattle, Wash., held a spirited meeting on the evening of Tuesday, Jan. 2, when officers for the ensuing year were elected as follows:

President.....E. S. Booker
Vice-President.....George Eckman
Secretary.....L. R. Rowntree
Treasurer.....E. Jones

Various matters of trade interest were discussed and the building situation considered in its leading aspects.

Election of Springfield Builders' Exchange

The members of the Builders' Exchange of Springfield, Ohio, held their annual meeting on Jan. 5, when officers for the ensuing year were chosen as follows:

President.....B. O. Sargent
Vice-President.....H. C. White
Treasurer.....Thomas Welsh

The new officers were to be installed at the annual banquet of the organization to be held in the new Shawnee Hotel later in the month. The arrangements for the banquet were in charge of an Entertainment Committee, of which Charles Bauer is chairman.

New Orleans Exchange Has a "Smoker"

The members of the Contractors and Dealers' Exchange of New Orleans, La., turned out in full force for the annual "smoker" held Dec. 20 at the headquarters of the organization. James H. Aitken was master of ceremonies, and, after sketching the history of the Exchange since its organization more than 100 years ago, paid a glowing tribute to President Thomas for the work which he had accomplished. L. A. Livaudais, one of the well-known architects of the city, urged the Exchange to take steps looking to the establishment of a trade school. Edgar M. Christy, chief architect of the city engineer's office, said he expected the city to have much building in the near future which would include work of all kinds.

Herman H. Thomas was installed as president of the Exchange for the third time, and as showing the appreciation of the members for what he was doing they presented him with a handsome picture of himself and a magnificent silver service. By a unanimous vote of the Board of Directors R. L. McChesney was reappointed secretary for the fifth term.

New Officers of Philadelphia Exchange

At the recent annual meeting of the Master Builders' Exchange of Philadelphia, Pa., the following officers were chosen:

President.....Jacob L. Tyson
First Vice-President.....O. W. Ketcham
Second Vice-President.....E. E. Hollenback
Third Vice-President.....W. Nelson Mayhew
Secretary.....Charles E. Smith
Treasurer.....P. S. Smith

Various directors were elected to take the place of those whose terms expired.

Building Outlook in Michigan

According to Secretary Orr of the Builders and Traders' Exchange of Lansing, Mich., the past year was unprecedented in the building history of the city and in the success of the exchange. It seems to be the consensus of opinion among the members that the new year will mark no cessation of building operations in the city.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS FOR DECEMBER SHOW 4.38 PER CENT INCREASE OVER DECEMBER, 1915

THE gratifying activity which has prevailed for some months past as reflected by the building improvements for which permits have been issued throughout the country, continued in December, and reports from 115 cities show a gain of 4.38 per cent as compared with December, 1915. As was the case in November, the Southern tier of States show the largest increase as compared with the year before, and next in order are the extreme Western States. In the East there was a loss in December of 6.29 per cent as compared with the same month of the previous year. This was due largely to the shrinkage in the planning of new work in Boston and to the falling off in tenement house construction in the Borough of the Bronx, New York. Of 43 Eastern cities reporting, 20 show an increase and 23 a decrease. The accompanying table shows the relative activity in the cities reporting.

CITIES OF EASTERN STATES

	December, 1916	December, 1915
Albany	$159,625	$340,290
Allentown	124,915	21,850
Atlantic City	154,141	442,344
Bayonne	92,521	127,348
Binghamton	98,134	117,008
Boston and vicinity	5,240,000	6,596,000
Bridgeport	480,335	701,740
Buffalo	1,207,000	895,000
Elizabeth	187,793	230,828
Erie	132,805	104,523
Harrisburg	34,175	108,450
Hartford	306,017	318,390
Haverhill	131,000	357,550
Hoboken	13,120	12,315
Holyoke	17,400	57,900
Manchester	42,200	54,615
Newark	775,223	493,427
New Bedford	328,564	166,180
New Britain	114,900	22,065
New Haven	241,163	283,955
New York:		
Manhattan	5,127,580	4,126,085
Bronx	664,037	2,286,886
Brooklyn	3,235,474	4,297,930
Queens	912,125	1,440,600
Richmond	472,464	135,962
Passaic	67,800	49,475
Paterson	339,043	232,147
Philadelphia	5,460,865	2,703,070
Pittsburgh	1,199,916	2,995,596
Quincy	136,155	136,280
Reading	88,700	7,000
Rochester	604,028	647,300
Schenectady	95,420	75,990
Scranton	187,614	92,101
Springfield	705,525	596,790
Syracuse	210,695	359,895
Trenton	60,446	71,489
Troy	58,450	28,935
Utica	60,750	54,150
Wilkes-Barre	65,050	79,786
Woonsocket, R. I.	33,340	57,660
Worcester	463,370	230,857
York, Pa.	17,340	15,337

From the Middle or Central West we have reports from 37 cities, of which 23 show an increased amount of new work planned, while 14 show a falling off, as compared with December, 1915, the result being a gain of 9.1 per cent. The striking feature is found in the heavy shrinkage in Chicago, Milwaukee and St. Paul, and the notable gains in Cleveland, Des Moines, Detroit, Fort Wayne, Minneapolis, Indianapolis and St. Louis.

CITIES IN MIDDLE STATES

	December, 1916	December, 1915
Akron	$648,115	$566,425
Canton	150,310	161,700
Cedar Rapids	66,000	85,000
Chicago	5,852,500	10,642,000
Cincinnati	998,345	1,113,110
Cleveland	3,080,980	2,985,825
Columbus	242,340	150,340
Council Bluffs	20,000	4,500

CITIES IN MIDDLE STATES (Continued)

Davenport	34,872	120,985
Dayton	341,278	120,195
Des Moines	1,223,089	82,355
Detroit	3,990,110	2,966,360
Duluth	201,795	172,491
East St. Louis	25,735	10,795
Fort Wayne	447,975	106,500
Grand Rapids	254,961	130,820
Indianapolis	527,664	424,736
Joplin, Mo.	35,514	27,400
Kansas City, Kans.	42,865	36,595
Kansas City, Mo.	775,350	612,525
Lincoln	111,488	64,685
Milwaukee	621,043	781,475
Minneapolis	4,294,265	1,294,340
Omaha	797,400	643,830
Peoria	151,775	117,176
Saginaw	26,010	12,196
St. Joseph	21,230	37,331
St. Louis	1,573,862	637,977
St. Paul	1,592,875	1,816,731
Sioux City	69,590	165,400
Springfield, Ill.	92,530	43,600
Superior	10,690	19,240
Terre Haute	18,980	20,865
Toledo	441,194	350,425
Topeka	24,380	26,750
Wichita, Kans.	518,950	188,050
Youngstown	214,830	336,125

Coming now to the Southern tier of cities, we have reports from 21, of which 9 show a loss and 12 a gain, with a resultant increase of 39.95 per cent This is due largely to the increased planning of new work in Baltimore, New Orleans, Oklahoma City, Washington and Wilmington. In Baltimore the increase is nearly three times that of December, 1915.

CITIES IN SOUTHERN STATES

	December, 1916	December, 1915
Atlanta	$177,746	$255,559
Baltimore	1,016,633	360,842
Beaumont	156,500	58,886
Birmingham	255,998	140,485
Charlotte	31,280	90,515
Chattanooga	60,890	92,726
Dallas, Tex.	236,015	311,169
Fort Worth	218,695	81,240
Jacksonville	137,635	236,663
Houston	292,244	509,603
Huntington	466,905	80,189
Louisville	64,200	209,830
Memphis	136,010	110,040
New Orleans	251,580	172,892
Norfolk, Va.	107,662	199,227
Oklahoma City	199,475	61,850
San Antonio	194,800	334,500
Savannah	45,993	29,475
Tampa	95,830	68,735
Washington	1,394,576	540,679
Wilmington	132,278	108,225

In the extreme West, including territory lying beyond Denver, 14 cities show an increase of 22.42 per cent, due largely to the greater activity in Colorado Springs, Los Angeles, Denver, Sacramento, San Francisco, Tacoma and Spokane.

CITIES IN EXTREME WESTERN STATES

	December, 1916	December, 1915
Berkeley, Cal.	$95,000	$215,900
Colorado Springs	33,025	9,265
Denver	299,170	128,440
Los Angeles	1,479,973	1,030,388
Oakland	390,039	286,525
Pasadena	82,182	101,372
Sacramento	379,181	153,669
San Diego	55,725	64,179
San Francisco	1,364,479	1,138,966
San Jose	22,227	42,164
Seattle	445,290	605,385
Spokane	53,570	15,120
Stockton	81,480	129,369
Tacoma	85,945	55,088

The annual convention of the National Builders' Supply Association will be held in Chicago Feb. 12 and 13.



The Building Age

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Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

Economy of a Concrete Mixer for Mixing Mortar

The fact is rapidly being forced upon the attention of building contractors in all parts of the country that it is a most economical plan to utilize a single concrete mixer in connection with building construction not alone for mixing all the concrete for the foundation walls, but also the mortar used by the bricklayers and plasterers on the job. A most practical demonstration of this fact was recently made by a general contractor in Chicago—E. J. Panos of Thirty-first Street and Crawford Avenue—who specializes in dwelling houses and small apartment buildings and usually has a row of six or more under way at one time.

His methods are to construct all foundations and basements first using sectional wood "forms" and mixing the concrete with a machine, which he later utilizes for mixing the mortar for brickwork and plastering.



Fig. 1—Showing the Charging Side of the Mixer with Mortar Box and Sand in the Foreground



Fig. 2—The Discharge Side of the Mixer, Showing the Thorough Manner in Which the Mortar is Mixed

The mortar box is placed on the ground about 15 feet from the charging side of the mixer. A preliminary mix is given the mortar in the mortar box and it is then shoveled on boards by the side of the mixer. Sufficient mortar to last one or two days is usually given the preliminary mix at one time. The final mixing is done in the machine and two men are able to turn out enough mortar in half an hour to supply 15 bricklayers for half a day. The usual practice is to mix enough in the morning to last until noon and immediately after the noon hour mix the additional quantity required during the afternoon.

This contractor uses a 10 cubic foot "The Standard" Low Charging Mixer in all of his building operations, the peculiar design of the blades of the mixer being such as to enable it to mix mortar as well as concrete. The blades on the charging side give the mortar a preliminary mix as it enters the drum and mixing is so rapid that a batch can be discharged almost as soon as charging is completed. The mortar is discharged on boards placed on the ground from which the hod-carriers shovel it into their hods as required. The pictures show the machine mixing mortar on one of the jobs of this contractor located on Harding Avenue near Thirty-first Street, Chicago. Fig. 1 shows the charging side with the sand in the foreground, beyond which is the mortar box from which the preliminary mixed mortar is shoveled upon boards by the side of the mixer in most convenient location for charging. Fig. 2 shows the discharge side and illustrates the very thorough manner in which the mortar is mixed as well as its stiff nature with no tendency to run. The daily economy of mixing mortar for 15 bricklayers with the machine as compared with mixing by hand is estimated by this contractor as follows: Owing to the more thorough mixing of the machine one barrel less lime is required for each box of mortar. It requires but one hour a day for two men to mix enough mortar with the machine to last the bricklayers the entire day whereas the entire time of two men is needed to perform the mixing by hand. On account of the very thorough mixing of the machine no time of the bricklayers is required in tempering the mortar which is figured as a saving of one hour a day for each bricklayer. At present prices this is estimated a total saving of $18 a day. There is also an advantage in cold weather of being able to mix the mortar dryer with the machine than is possible when mixed by hand. Among the economies of using a single machine to mix both concrete and mortar as compared with a separate mixer for the mortar are only one machine to buy, haul on the job, attend and keep in repair in place of two, and the greater reliability of the concrete mixer.

How to Use Cement

One of the most valuable booklets relating to cement-concrete which has come to our desk in the recent past is that entitled "Alpha Cement, How to Use It," now being distributed by the Alpha Portland Cement Co., Easton, Pa. A number of pages are devoted to the materials of which concrete is composed with statements of the varying requirements of aggregates in the way of sand, stone, cinders, slag, etc. A table of recommended mixtures for the wearing courses of one course floors and pavements is given; also for reinforced concrete roof slabs, fence posts, concrete construction subjected to water pressure; reinforced concrete walls, floors, beams, columns, etc.; house walls above ground when stucco finish is and is not to be applied; the mixtures of mortar most suitable for various purposes; the adding of water to the mix; the placing, spading and protection of the concrete, etc. The method of figuring amounts of materials is given, also a table showing the various materials required for one cubic yard of concrete. Five pages are devoted to a description of "forms." Valuable information is given concerning reinforcement, repairing foundations, concreting in cold weather, making concrete watertight, concrete blocks and bricks, etc. There are also descriptions and working drawings of how to make concrete posts, foundation walls and steps, walks and floors, curbs, small concrete buildings, barns, silos, septic tanks, etc. Directions for stuccoing are presented, as well as the manner in which the lathing is applied, working methods, finishes, etc. A number of houses and their floor plans are given, together with small garages, which are accompanied by working drawings and bills of materials for the concrete work. One of the interesting features is a page devoted to definitions of the various cement terms. A standard specification for cement is given. Several pages are given up to answers to questions about concrete construction that frequently arise. The book is profusely illustrated by photographs and drawings. Considered as a whole, the little volume is a valuable addition to the library of trade literature of the builder who is in any way concerned in the execution of concrete work.

Additions to Stanley Garage Hardware Line

With a view to meeting the constantly growing requirements in the way of garage hardware, The Stanley Works, New Britain, Conn., have added to their already extensive assortment three items which are especially intended for use on garage and other heavy doors. The single-thumb latch set, known as No. 1263 and shown in Fig. 3, is, like all Stanley garage hardware products, made entirely of wrought steel and is therefore said to be greatly superior to the old style of cast-iron latch. The bar is 12 in. long and the thumb piece used in connection with it is referred to as an additional improvement. The duplex latch No. 1264, shown in Fig. 4, has two handles and thumb pieces which provide a comfortable grip in handling the garage doors from either side of the entrance. It is adjustable for thicknesses ranging from 1¾ in. to 2¼ in. The makers state that this duplex latch can be supplied on special orders for doors of any thickness. In applying, the parts are put together without the use of tools or set screws, and when once applied to the door cannot become loose or drop out. The latch is made entirely of heavy wrought steel and therefore designed for heavy service. The combination screw holes in the escutcheon plate permit of securely bolting the plates together through the door, using ¼-in. stove bolts. The bar in this case is also 12 in. long. The heavy door handle or pull No. 1266, shown in Fig. 5, matches the other two-latch sets, and is for use on the inside of the opposite door. The handle is reinforced by corrugations at the points of greatest strain and is designed to develop the full strength of the metal. The grip is of generous size and rounded to conform to the shape of the hand. The handle proper is 10½ in. long and 1¼ in. wide in the middle and 2½ in. wide at the ends. The latches and pulls are finished in dead black japan, bright japan, Stanley sherardized and black japan over Stanley sherardized. The heavy escutcheon plate, measuring 14½ x 2¾ in., is claimed to greatly improve the appearance of these latches and pulls, and by spreading out the position of the screws and bolts over a larger area these escutcheons considerably increase their gripping power. The plates are equipped with combination holes for bolts or screws. A copy of the Stanley garage hardware catalog illustrating and describing the various items which comprise the Stanley garage hardware line will, we understand, be sent free to any reader of THE BUILDING AGE writing to the Service Department of The Stanley Works, New Britain, Conn.

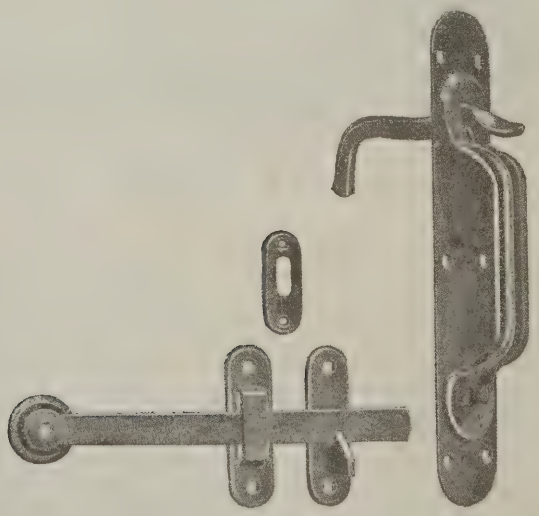


Fig. 3—The Single Thumb Latch Set

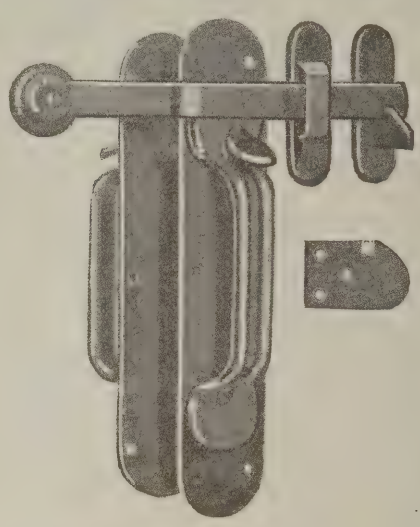


Fig. 4—The Duplex Latch



Fig. 5—Heavy Door Handle or Pull

"Redwood" in Story Form

One of the latest booklets describing Redwood was singularly appropriate for the Christmas holidays, at about which time it was being distributed by the California Redwood Association, New Call Building, San Francisco, Cal. It is entitled "Two Births" and is dedicated to the children of the nation. In simple story form is told the great age and size of the redwood tree, its fire and rot resisting qualities and something of its finished beauty. Although the booklet

and its illustrations are of a popular nature, yet much information of value and interest to the builder is contained therein.

Improved Electric Floor Surfacing Machine

A floor surfacing machine embodying features of construction and operation which cannot fail to interest



Fig. 6—Improved Electric Floor Surfacing Machine

a large class of our readers has just been placed upon the market by Wayvell Chappell & Company, 356 and 358 West Madison Street, Chicago, Ill., and a general view of which is presented in Fig. 6. The machine is of simple construction, and one of the most valuable improvements incorporated is the mounting of the sanding roller so that one end extends just beyond the side of the machine for the purpose of securing uniform work throughout the room and close up to the baseboard. The sanding roller may be quickly changed to the other side of the machine, when required, thus enabling the operator to reach the wall all the way around the room. The frame is mounted on a base and is adjustable at both ends by thumbscrews to level the roller to the floor and which press against cushions to absorb all vibration. The frame is very rigid, being well ribbed so as to give great strength and stiffness. Another valuable improvement is the mounting of silent roller chain and sprockets, case hardened, making a durable transmission, as the hardest wear and tear on a machine of this kind comes on the running parts. Close behind the roller is placed a chain-driven fan countershaft on which is mounted the manufacturers' automatic dust collector, which consists of a 9-in. diameter suction fan running at high speed on ball bearings. The machine balances back of the supporting wheels to automatically raise the roller from the floor when releasing the handle to stop cutting. Still another important feature of the machine is found in the mounting of the sanding roller and the electric motor on the same frame, so as to secure a smooth-running, even-tension chain, and by flexibly and adjustably supporting this frame on a base, so as to secure a yielding control over the sanding roller, which is said to be the secret of its perfect work. The roller, of cylinder construction, is a steel shell, covered with extra heavy non-stretchable felt which forms a cushion for the sandpaper. This is tightly bound around the roller by a pair of heavy interior rollers which draw and firmly clamp the two ends of either light or heavy sandpaper inserted through the roller slot. With each machine is furnished a metal pattern to which the sandpaper may be quickly and accurately cut to fit the roller so that it requires but a few seconds to renew the paper. The handle is rigidly attached to the rear to guide the machine. The switch is on the handle within easy reach of the operator, so that no time is lost in turning on or shutting off the power. This latest improved type of automatic ball-bearing electric floor surfacing machine is made in three sizes, each of which has a surfacing roll of 8 in. diameter and 9 in., 12 in. and 15 in. length respectively. The picture presented herewith represents the latest type of machine with all the new improvements.

The Concrete Dope Book

We have just received a copy of the second edition of the "Concrete Dope Book," which is compiled and published by the Cement Tile Machinery Company, 124 Rath Street, Waterloo, Iowa. It contains a great deal of information relative to concrete and concrete work which the practical builder will find of value in connection with his business. Among the early pages is an illustrated description of the "Winner" model of concrete mixer, which is said to be "built on the square and sold on the square." Numerous tables are given, showing the materials required for 100 sq. ft. of concrete floor, also of concrete sidewalk; the cost of solid concrete foundations varying from 20 x 20 ft. in area to 24 x 26 ft.; the quantities of materials required for plaster work; making and setting of foundation "forms"; Fuller's rule for quantities; tables showing the materials for 1 cu. yd. of concrete as well as of 1 cu. yd. of rammed concrete; the thickness of foundation walls for buildings of various heights, and the cost of various classes of concrete construction. There are in addition tables relating to concrete blocks and the cost of 100 made with a 1:2:4 mix and with a 1:2:5 mix; the materials required for 1000 brick; the number of common brick required for different walls; suggestions for estimating quantities for plaster and mortar; the estimated cost of "form" work; the materials required for and cost of exterior plastering; data on handling concrete and calculations in regard to concrete pavement.

Parks Double Drum Sanding Machine

Among the new machines shown in the catalog just issued by the Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio, is a double-drum sander which is so built as to meet the demands of a great many carpenter shops for a cheap serviceable sand-

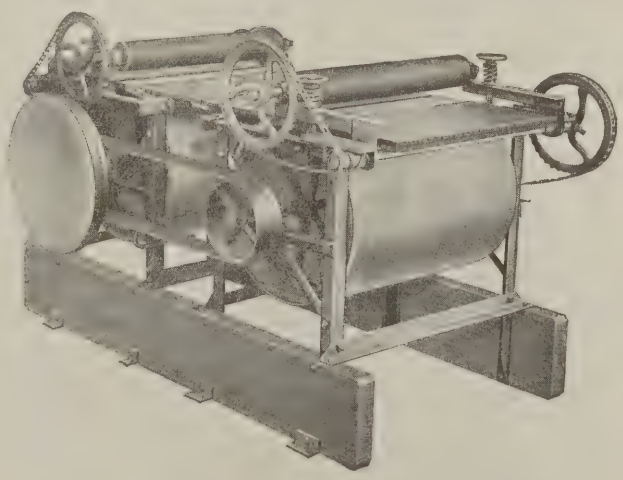


Fig. 7—Park's Double Drum Sanding Machine

ing machine. The machine shown in Fig. 7 is made in two sizes, 24 in. and 36 in. wide, and has feed rolls for carrying the material over the sand drums. Each drum is covered with Brussels carpet and sandpaper. Two speeds are furnished, and by fitting the drums with the desired grade of sandpaper the machine will

meet the requirements of almost any shop which does not have work to justify the installation of a high-priced sander. Catalog No. 10 showing this machine will be sent to any of our readers upon request to the company at the address given.

Sedgewick Dumb Waiters

The dumb waiter is a necessary adjunct of many houses, especially of flats and apartment buildings, and information concerning the installation of the Sedgewick Dumb Waiter contained in a circular sent out by the Sedgewick Machine Works, 123 Liberty Street, New York City, cannot fail to prove valuable. On one side of the circular is a s t of specifications for the installation and on the other side is a set of working drawings relative thereto. Additional information regarding the dumb waiter is also set forth. These dumb waiters are guaranteed for a period of five years, and it is said that the catalog sizes can be shipped the same day the order is received, while special sizes can be shipped in as short a time as three or four days. Blueprints, as well as full directions for installing, etc., are furnished with each outfit. The company's service department will collaborate with architects and builders upon the proper dumb waiter or elevator equipment necessary to the securing of specific results under specific conditions.

"Northwestern" Concrete Mixers on the Panama Canal

One of the many indications of the growing popularity of concrete mixers as turned out by the Northwestern Steel & Iron Works, Eau Claire, Wis., is seen in the order which was filled last summer for a carload of these mixers shipped to the Panama Canal. They were to be used in connection with the laying of the foundations for lighthouses and other permanent work in that portion of the canal where the banks gave way. So well satisfied have the Panama Canal engineers been with the above purchase that they recently ordered four more mixers of the same size and capacity for work on the other end of the canal zone, this last shipment having been sent forward to Panama on Dec. 28. The efforts of the company have been concentrated in producing a mixer of sterling qualities at a low price, and that these efforts are being appreciated is seen in the orders recently received from various governments.

"Bulletin" on Raydiant System of Sidewalk Construction

An elaborately printed and technically complete "Bulletin" dealing with the "Raydiant" system of sidewalk and vault light construction has just been issued from the press by the Berger Manufacturing Company, Canton, Ohio. This "Bulletin" contains valuable data and illustrates and describes practically every detail relating to the system in question likely to interest the architect and building contractor. Attention is first given to the construction in general, then come materials of construction; Lazalite glass, malleable coated; design of glass; easy replace feature of the "Raydiant special" system; specifications; installation in detail; concreting; expansion joints; tables of safe loads, etc. The "Bulletin" is one which should prove a valuable addition to the trade files of the architect and builder and we understand that a copy can be obtained on application to the company.

Slate Prices Advance

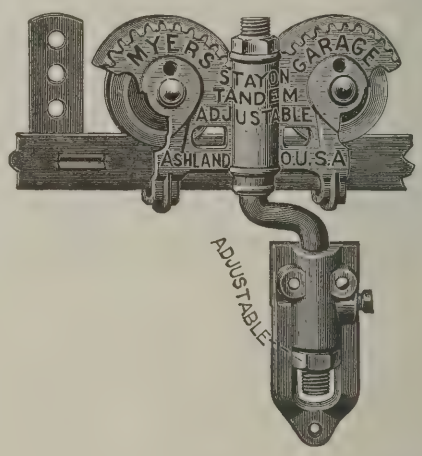
Notice is given by the North Bangor Slate Company, Bangor, Pa., that, effective Jan. 1, prices of their slate and black slate generally have advanced an average of 5 to 10 per cent on the different sizes and grades.

For Manufacturers of Builders' Materials

The firm of Hanney Sons, Builders Incorporated, Central Street and Virginia Terrace, Evanston, Ill., contemplate the erection of about forty houses during the spring and summer and are now making plans to build a model home and are therefore anxious to obtain everything on the market in the way of new devices that will be of benefit to the purchaser of one of these homes. No expense will be spared in making the home "a model" in its way, and the builders are desirous of obtaining literature in the way of catalogs, circulars, etc., from manufacturers of building materials, supplies and equipment likely to prove of interest along the lines indicated.

Myers' New Garage Door Hanger

For the purpose of more fully meeting the requirements of their trade, F. E. Myers & Bro., Ashland, Ohio, have just placed upon the market a new garage



Myers New Garage Door Hanger—Fig. 8—General View

door hanger, illustrations of which are presented herewith. This hanger has a malleable iron frame of such a nature that the wheels are completely covered. It is adjustable to and from the building as well as up and down. It is provided with steel roller bearings and is said to be easy to push and pull. It is especially adapted to garages and is so constructed that the door



Fig. 9—A Section of the Track

passes around the corner and opens the entire front of the building. In addition to this an ordinary door 30 in. wide is used to permit of the entrance by an individual to the garage without the necessity of moving the larger doors. Instead of using two doors hinged together for the entrance of the car to the building, three doors hinged together can be utilized by making



Fig. 10—Manner of Forming the Bend in the Track at Corner of the Building

them 30 in., 36 in. or 42 in. wide. In Fig. 8 is shown a general view of the hanger, while Fig. 9 illustrates a section of the track, and Fig. 10 shows the manner of forming the bend in it to permit the door to pass around the corner of the building. It is pointed out that the crank-shaped stem permits the hanger to be used in connection with any thickness of door, while the vertical adjustment is made by the nut on the lower end.

Catalog of Carborundum Products

A handsome catalog of abrasive products has recently been issued by the Carborundum Company, Niagara Falls, N. Y. In addition to its value as a reference book and as a text book on abrasive materials, this new publication is a beautiful example of the engraver's and printer's art. It is printed in two colors, uniquely made up and is illustrated by very fine halftone engravings printed on heavy plate paper. Carborundum and "Aloxite," two artificial abrasives manufactured by the company, are fully described in the early part of the book. The manufacture of sharpening stones is covered briefly but sufficiently to give the reader some little knowledge of the main points of this industry. The use of each stone is described and a complete list of sizes, grades and prices is given. The range of products covered by this catalog includes among others sharpening stones of various sizes and types, combination stones, silversmith's stones, combination knife stones, engraver's pencil points, knife sharpeners, sportsman's and pocket stones, scythe stones, valve grinding compounds, grinders, rubbing bricks and stones, carborundum and aloxite wheels, aloxite cloth, etc. The catalog contains forty-eight pages and is bound in green covers embossed in gold.

New Sales Manager for General Fireproofing Co.

Announcement has been made that William B. Turner, formerly advertising manager of the General Fireproofing Company, 301 Logan Avenue, Youngstown, Ohio, has been appointed sales manager of that organization. He succeeds Paul R. Clark, who has assumed direct charge of the affairs of the Fireproof Products Company of New York City, which is the New York agent for the General Fireproofing Company. A farewell banquet was held to honor Mr. Clark, and his fellow employees presented him with a gold watch and chain as a token of their esteem.

The Willis Line of Sheet Metal Products

We learn that there has recently been placed upon the market by the Willis Manufacturing Company, Dept. A, Galesburg, Ill., a hog-house skylight which is meeting with much success. The skylight is claimed

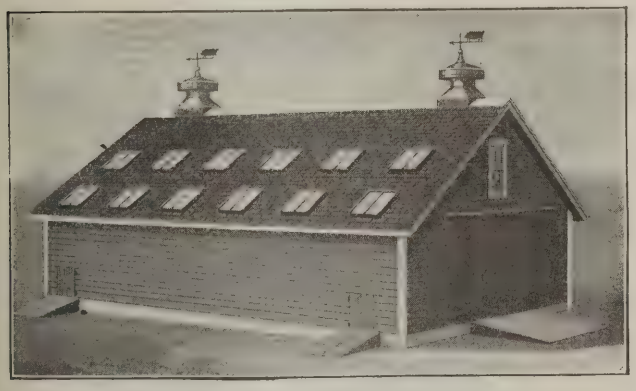


Fig. 11—The Willis Hoghouse Skylight

to embody many advantages, being strongly constructed and of such a nature that very little work is required in putting the skylights in place. Another point to which reference is made is their low cost. The company has issued a 170-page catalog profusely illustrated and containing a great deal of information of special interest to every progressive builder. It shows the Willis line of sheet metal products and renders the catalog an excellent book of reference as well as a buyers' guide. We understand that any reader of THE BUILDING AGE desiring a copy of this catalog can secure one from the company, and it will undoubtedly be found of great convenience for use in connection with preparations for the opening of the building season. A general view of the hog-house skylight is shown in Fig. 11.

The Martin One-Ton Semi-Trailer

The attention which building contractors all over the country are at present giving to the question of motor trucks for use in connection with their business in place of horse teams will render more than usually interest-

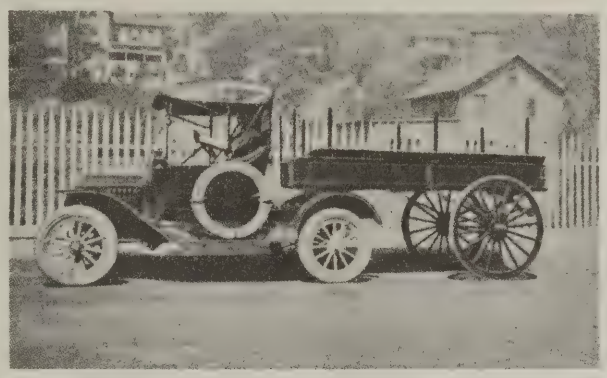


Fig. 12—Martin Semi-Trailer Attached to a Ford Car

ing some literature relating to the Martin 1-ton semi-trailer with Martin patent rocking fifth wheel which is being sent out by the Martin Rocking Fifth Wheel Company, Springfield, Mass. In this connection it may be stated that a semi-trailer consists merely of the rear axle, rear springs and body of a wagon, the forward end of the wagon being free to rest over the rear axle of a motor vehicle so as to become, in effect, a part of the motor vehicle itself. The greater portion of the load rolls on the semi-trailer wheels, so that it is really pulled by gasoline power in place of animal power. The Martin semi-trailer here referred to is intended for use in connection with Ford cars, and follows the general principles of wagon construction. The company points out that this semi-trailer, together with the Martin patent rocking fifth wheel, affords a quicker and cheaper method of moving a 1-ton load than by any other means, and can be safely drawn at a speed of 20 miles an hour if desired. The point is also made that the semi-trailer can be attached or detached in a few minutes, leaving the Ford free to shift from one job to another at short notice. The same Ford can be used for either pleasure or business, according to requirement, the fifth wheel being of such a nature that it can be quickly detached, leaving no evidence that the car has been used for commercial purposes. The picture, Fig. 12, shows the trailer attached to a Ford car.

Rust-Proofing Iron and Steel

We are informed that the Parker Rust-Proof Company of America, Detroit, Mich., has just completed negotiations for the purchase of the Thomas Watt Coslett (Coslettizing) patents Nos. 870937 and 1700069, as well as all other improvements which may hereafter be made in rust-proofing by Mr. Coslett. With the patents now owned by the corporation, the latter is said to control the entire rust-proofing art.

Upson Processed Board

Many carpenters with shops well equipped for bench work often overlook the fact that high quality wall board is adaptable to numerous purposes besides its use as a substitute for lath, plaster and wallpaper in lining walls and ceilings. For instance, screens, cabinets, closets and a great number of household articles for handy use or decoration can be made by the carpenter to sell to his customers at a modest price

—yet which will allow a fair profit. This work can be done between other jobs, and suggestions will be furnished, if desired, by The Upson Company, 20 Upson Point, Lockport, N. Y. The point is made that Upson Processed Board is well adapted for the purposes because it is strong and is waterproofed, does not warp to any appreciable extent, and pleasing effects result with one or two coats of any artistic shade of paint.

New Builders' Concrete Mixer

An announcement which is likely to prove of interest to builders generally has just been made by the American Cement Machine Company, Inc., Keokuk, Iowa,

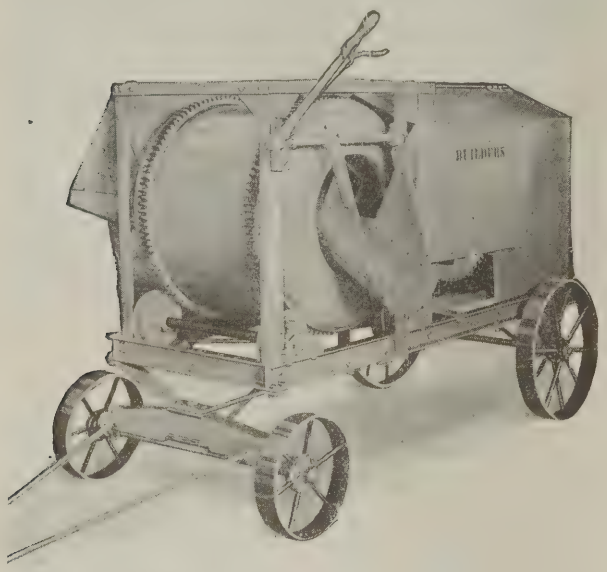


Fig. 13—General View of the Builders' Concrete Mixer

to the effect that it has placed on the market a new concrete mixer of an improved type designed especially for the general use of building contractors and others having to do with concrete construction work, owing to the fact that it has several features worthy of more than passing notice. The mixer, known as the "Builders' Mixer," is a half-sack size low-charger, mounted on steel trucks, and with a special gasoline engine as the motive power. It is referred to as simple in construction, having no complicated mechanism, and has full engine housing. The mixer is of the high-speed type, having a patented high-speed mixing and discharge action that permits of a perfect mix in minimum time. The company says that it "speeds up the jobs, cuts down the time and labor expense, and adds substantially to profits on every job where it is utilized." Its convenient size and low charging feature make it well adapted to service on a great variety of jobs, and is a further aid to time and labor saving. One of the most interesting features of the new mixer is its double-gear drive, an improvement that insures a steady running drum and eliminates all possibility of any wobbling. Another point worthy of mention lies in the fact that the builder can mix mortar in it just as well as concrete, and the company urges this feature strongly upon the consideration of masons and builders. We understand that the company is in a position to furnish some interesting facts and figures relative to the mixer as adapted to mortar mixing. A general view of the mixer is presented in Fig. 13 of the illustrations.

A New Five-Ton "Federal" Motor Truck

M. L. Pulcher, vice-president and general manager of the Federal Motor Truck Company, Detroit, Mich., states that a new five-ton model is now being made by them after a thorough test in the course of which it was driven thousands of miles up severe grades and over all sorts of roads. One of the tests consisted of a trip of 1176.6 miles, the five-ton truck being loaded with sand and driven from Detroit to Pittsburgh, and then brought back to Detroit over Pennsylvania, Ohio and Michigan roads. Federal officials decided upon this long run to Pittsburgh so that the truck might be given a thorough test under most strenuous conditions. For the purpose of the test the chassis was provided with a steel hydraulic dump body, which, filled with sand, made a total load of 20,000 pounds, and the way the motor handled this load on the severe grades was most gratifying to the Federal engineers.

Berger's New Insignia Design

The Berger Manufacturing Company, Canton, Ohio, has adopted a new insignia design which will be used in all the publicity of this concern in the future. The matter received a great deal of consideration, and it was finally decided to offer a substantial prize for the best design. The contest closed recently, and Miss M. A. Goodwin, a student in the Chicago School of Applied and Normal Arts, was the winner, submitting the design shown in Fig. 14 of the illustrations.

Fig. 14—The New Berger Insignia Design.

Coulson Store Front Construction

An exceedingly attractive catalog illustrating and describing the Coulson patent store front construction has just been issued from the press and is being distributed by J. W. Coulson & Company, 107 West Spring Street, Columbus, Ohio. The printing is on a good quality of surfaced paper and the binding is in embossed covers. The illustrations are excellent halftones, some of which show details of the construction in question, while others represent store fronts built in accordance with the company's system. The statement is made that these store fronts are furnished all ready to set in place and the various parts are easily installed, making an attractive, substantial and durable store front, while at the same time providing a safe setting for the glass. The matter is of a nature to render it especially valuable for the architect and builder particularly so as there accompanies the booklet full size details of the store front construction.

"Sealtite" Beaver Board

With the opening of the spring building season now rapidly drawing near, architects, builders and prospective house owners generally are likely to give more and more attention to materials entering into the construction and finish of buildings of all kinds. One of these materials which have been rapidly growing in

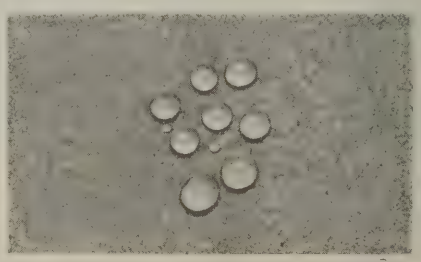
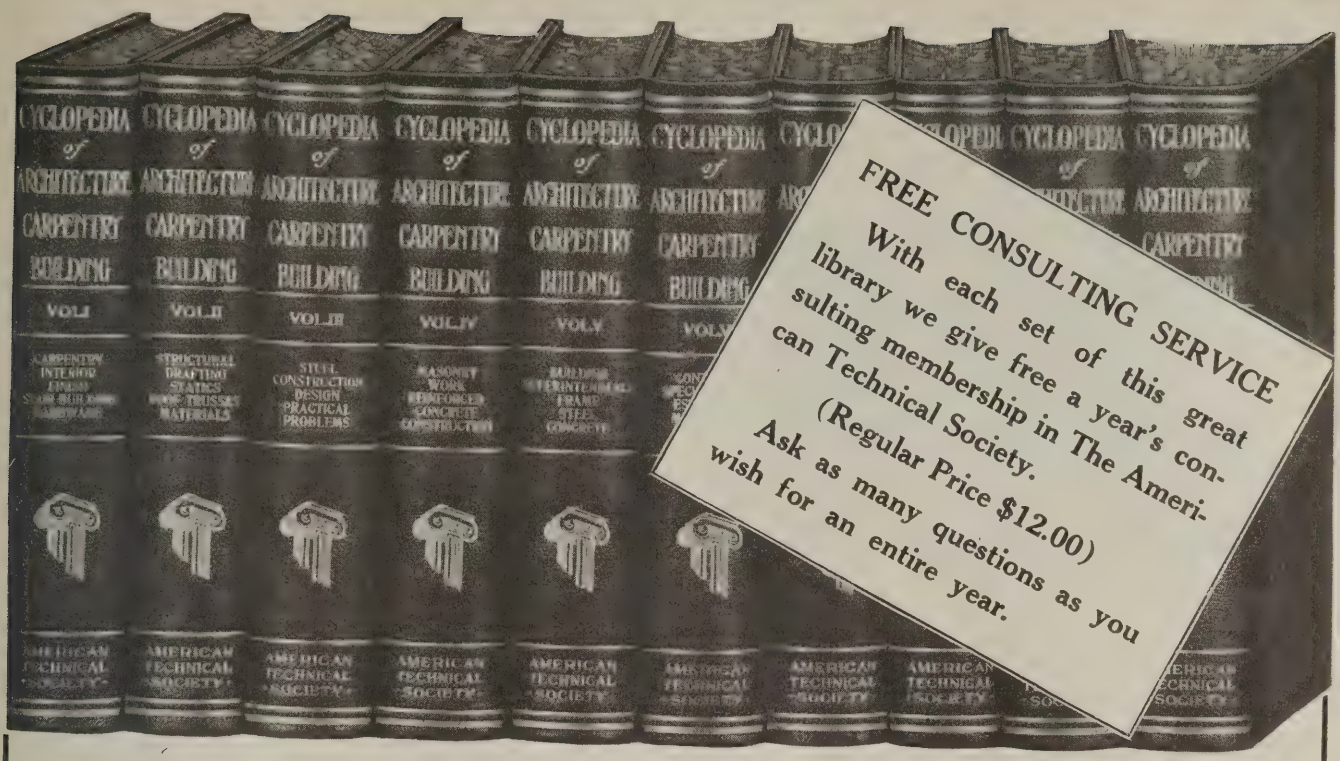


Fig. 15—Test of "Sealtite" Beaver Board

popularity and which is adaptable to a great variety of purposes and extensively used for making walls and ceilings of an attractive and dependable nature is Beaver Board. The popularity of panelled designs has brought builders and house owners to realize the monotony of the usual plain wall and ceiling produced by lath, plaster and wallpaper and to appreciate the

(Continued on page 26 of the advertising section)



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many pleasing effects which may be produced by the use of Beaver Board. One of the strong features of this wall board is the patented "Sealtite" treatment, a recently discovered process of surface sealing and sizing which protects both the front and back surfaces of the board from moisture or temperature changes. This

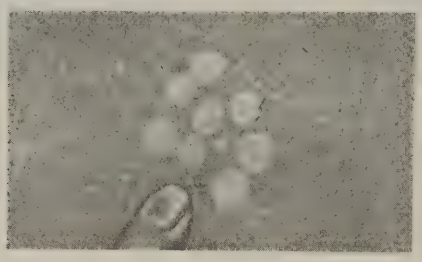


Fig. 16—Showing that Water Does Not Penetrate the Surface of "Sealtite" Beaver Board

is said to be an exclusive feature of Beaver Board and one which is making for it a steadily increasing popularity. Fig. 15 represents a test showing how "Sealtite" Beaver Board resists moisture, the illustration representing the formation of globules when water strikes the board, while Fig. 16 shows that when water is thrown off vigorous rubbing will not rough up the surface, thus demonstrating that the water has not penetrated below the "Sealtite" sealing.

Ironite Flooring and Waterproofing Patents Upheld

Announcement has been made by the Ironite Company of Chicago, Ill., of the successful termination of its litigation with the Master Builders Company in the case of the Ironite Company vs. the City of Rockford and the Master Builders Company, in the United States District Court, Northern District of Illinois, Western Division, in equity No. 30992, in which litigation the question of the validity of one of the patents owned by the Ironite Company was involved and the question as to whether or not the "Master Builders Method" was an infringement of such patent. A decree was entered in this case on Nov. 10, 1916, sustaining the validity of said patent and holding that the "Master Builders Method" was an infringement thereof.

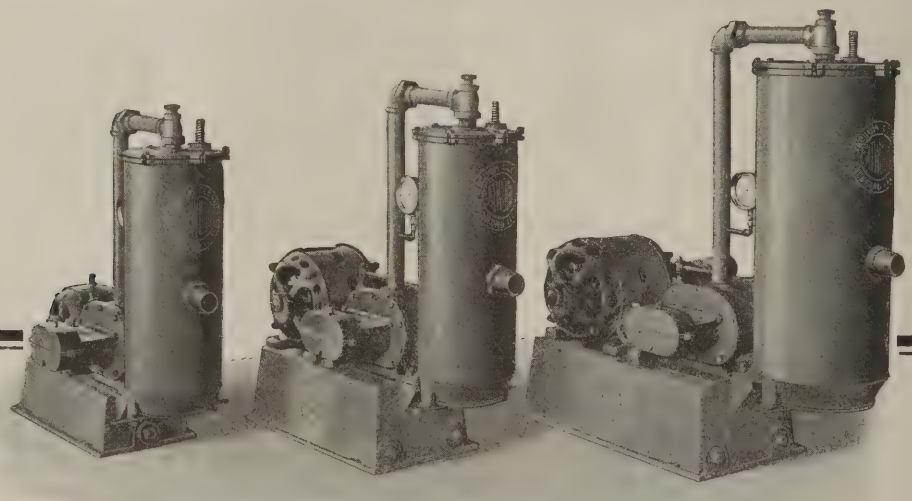
The "Master Builders Method" involves the use of metallic or metal-containing material in the treatment of concrete walls, floors or structures for the purpose of indurating, hardening, waterproofing, dustproofing and wearproofing the same, and was the method practised by the Master Builders Company in the treatment of the floor and walls of the new reservoir at the city of Rockford, Ill. The method referred to is said to be practically the same as used and recommended by the metallic floor hardener manufacturers and dealers.

It is presumed that the Ironite Company will take the necessary steps to compel other manufacturers of and dealers in metallic or metal-containing material for use in treatment of concrete to obtain licenses under their patents.

TRADE NOTES

A pleasant announcement was made to the employees of F. E. Myers & Bro., Ashland, Ohio, on Dec. 23, when each received a letter to the effect that the company had decided to provide each employee with a life insurance policy for $500, increasing yearly by $100 until a maximum of $1,000 is reached, the company bearing the expense as long as the employee remains with the company. The latter feels that in the event of an employee's death or permanent disability some

(*Continued on page* 41)



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extra provision should be made for his family, and the company has therefore taken this means to guarantee the protection.

The Joseph Dixon Crucible Company, Jersey City, N. J., has recently issued a new catalog of Dixon's graphite products. In it are illustrated a wide variety of articles made from graphite, including crucibles, bowls, retorts, stove cement, lubricating graphite, rope dressing, automobile greases, compounds, silica-graphite paint, electrical specialties, pencils, etc.

Hearty good wishes for Christmas and the New Year were extended to its many patrons by the Yaeger Machine Co., 216 West Rich Street, Columbus, Ohio, in an attractive pamphlet printed on tinted paper and distributed at the holiday season. The past year is said to have been a banner one for the company, which expressed its thanks to those who helped to make it so.

Greetings for a Merry Christmas and a Happy New Year, in the form of a gold-edged card, were distributed among its friends and patrons by the Willis Manufacturing Co., Dept. A, Galesburg, Ill.

By opening a new office at 911 Walnut Street, Des Moines, Iowa, Jan. 1, the H. W. Johns-Manville Co., New York City, now has a total of fifty-five branches scattered over the country. William B. Roberts, who has been with the company for a number of years, caring for the Iowa sales, has been appointed manager of the new office, and will have under him a corps of salesmen and construction men to make "Johns-Manville Service" a man-to-man service throughout that section of the country.

The cover of the January issue of *Door-Ways* bears a cordial 1917 greeting from the Richards-Wilcox Co., Aurora, Ill., to its friends and associates. The number contains a reproduction of a section of the article entitled "Arrangement of Sliding Partitions," which appeared serially in the BUILDING AGE a short time since. Accompanying the issue is a calendar bearing a picture of a little girl with a snowball, and bearing the caption "Temptation."

P. & F. Corbin, New Britain, Conn., sent out at the opening of the year a handsomely engraved folder extending the Season's Greetings to its many friends in the trade and wished them an "abundant portion of the blessings of prosperity."

A handsomely engraved card sent out to their friends and patrons conveyed the holiday greetings of R. J. Schwab & Sons Co., Milwaukee, Wis.

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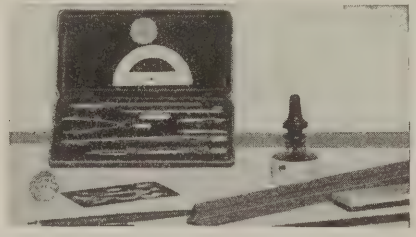
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SECTION THREE
Carpenters' Tools, Etc.

SECTION FOUR
Building Construction Material, Exterior (See also Sections 5 and 6)

SECTION FIVE
Builders' Hardware, Etc. Interior Finish, Equipment

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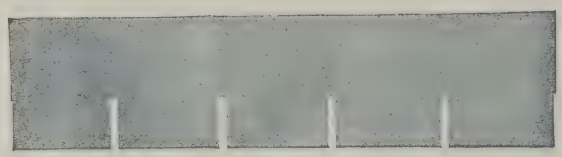


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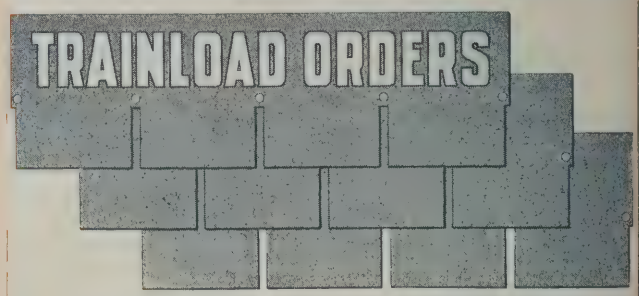
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The Building Age

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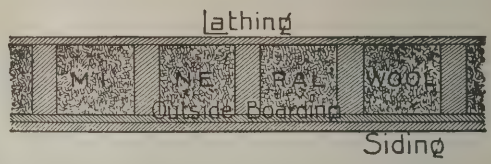
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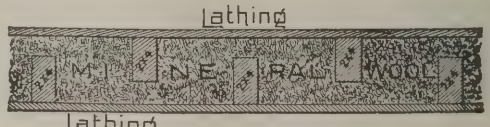
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BUILDING AGE

NEW YORK, MARCH, 1917



A CHALET BUILT BY A. S. BARNES OF LOS ANGELES, CAL.—ARCHITECT E. B. RUST OF OF THAT CITY

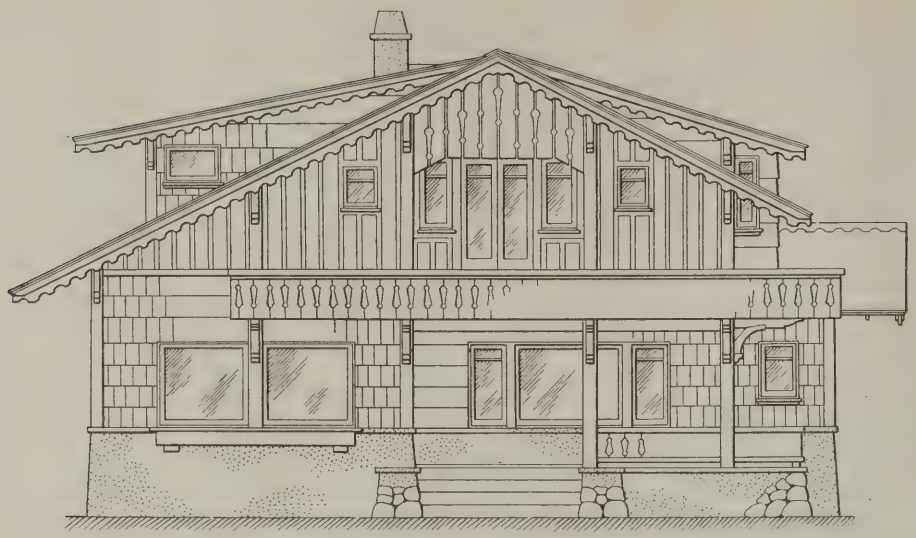
A CALIFORNIA CHALET OF STRIKING DESIGN

THE OPEN BALCONY WITH LOGGIA, THE PERGOLA AND THE SUN PARLOR ARE FEATURES

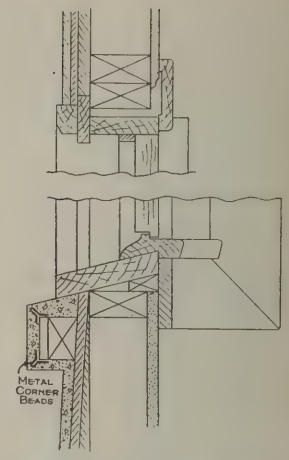
By Charles Alma Byers

THE Swiss chalêt, as a style of home architecture, has in the last few years come to be quite extensively employed in this country, and some very charming representatives of it are to be found, particularly in California. Readily lending itself to individual taste, it also, like the most of the styles we have borrowed from other lands, has had widely diversified interpretation, with the result that it has been converted into a type of home on which may be expended almost any sum of money and which can be variously located as to environment. Originally employed in this country mainly for the humbler sort of residences, it is now found represented in homes costing thousands of dollars; and, although seeming in the land of its nativity most adaptable to rugged surroundings, in America it has been made suitable not only for mountainous districts but also for even dignified city landscapes.

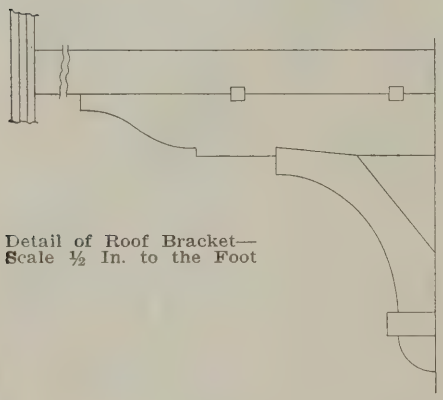
However, the Swiss chalêt, to be satisfactorily true to type, should present a rather rustic outside appearance, for rusticity constitutes one of its prominent characteristics, although it is possible to more or less modify it in this respect to meet individual requirements. Other exterior characteristics of the style are a slightly pitched roof, with wide extensions in the eaves and gables, and a prominent display, with occasional exceptions, of second-floor balconies. Moreover, these balconies, when used, in order that the most may be accomplished in the matter of creating the proper effect, should invariably possess vertically boarded railings, for in no



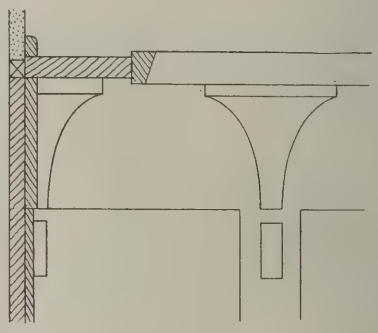
Front Elevation—Scale 3/32 In. to the Foot



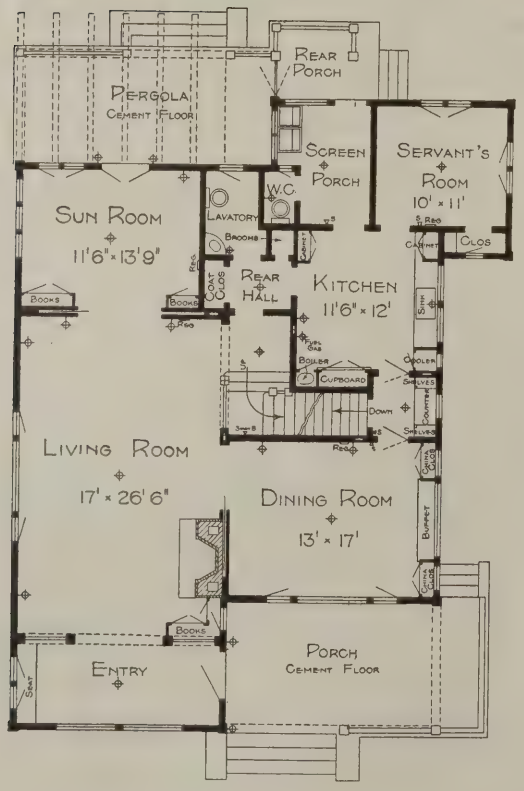
Vertical and Horizontal Sections Through Casement Window Frames—Scale ½ In. to the Foot



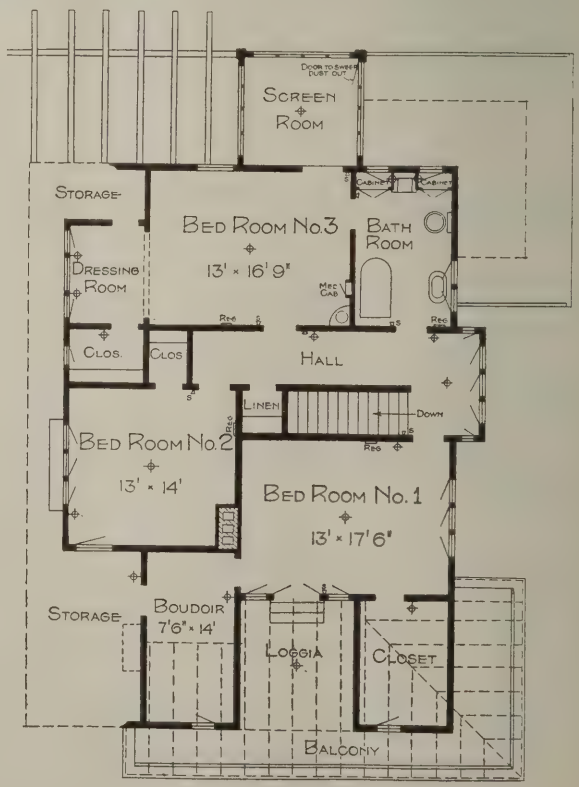
Detail of Roof Bracket—Scale ½ In. to the Foot



Details of Wainscoting in the Dining Room—Scale 1½ In. to the Foot



First Floor—Scale 1/16 In. to the Foot



Second Floor—Scale 1/16 In. to the Foot

PLANS, ELEVATION AND MISCELLANEOUS DETAILS OF CONSTRUCTION

other style of architecture is attention to details more necessary.

The chalêt here illustrated, located in California, is an excellent representation of the style, as interpreted in this country, and constitutes a particularly attractive and practical home of the moderate-priced type. It is situated in a residential district of a large city, into which it seems to fit most admirably, and yet it would be equally suitable for a rugged and picturesque setting—perhaps even for some leveled ledge of a steep hillside. In other words, while remaining true to the characteristics of the style in this respect, it is neither so rustic nor so formal but that it may be appropriately placed in almost any landscape scheme.

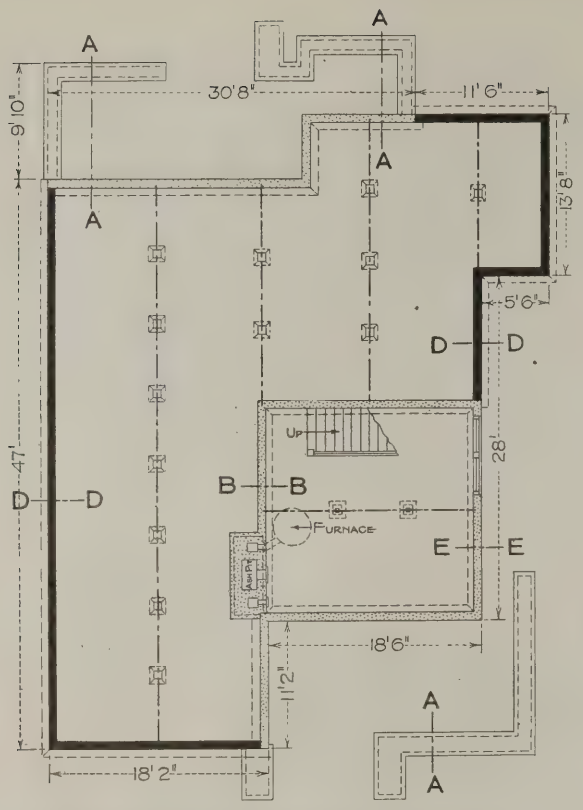
The house has a frontage of 36 ft. and a total depth of 56 ft. 2 in., and for the most part is two stories in height. On the front is a ground-floor porch, 21 x 11 ft. in size, and on one of the rear corners is a delightful pergola, 21 ft. 2 in. by 9 ft. in dimensions—both of which are floored with cement. Cement steps lead into the former from both the front and a rear corner, and similar steps lead from the pergola into the rear garden, while shut off from this pergola by a small appropriately designed gate is a tiny back porch, also floored with cement, which gives access to the rear screened porch. Into the front gable is recessed a second-floor loggia, 9 ft. 6 in. wide by 11 ft. deep, and over the front porch is a typical chalêt balcony, shaped like the letter L. The front portion of this balcony, with a railing length of 34 ft. 6 in., extends outward from the walls of the second story approximately 4 ft., and the side portion, with a railing length of 17 ft., comprises an extension of 6 ft. The whole of the front section and approximately two-thirds of the width of the side section are protected overhead by the wide overhangs of the roof.

The house rests on a foundation of solid concrete, and above the foundation, reaching to a point on a line with the bottom of the main first-floor windows, is a prominent base-course of cement stucco, furred over wood framing. The walls of the front porch and rear pergola elevations, however, consist of stucco over ordinary building brick, with pyramids of coblestones worked into the corners and at the sides of the approaches. The chimney is also constructed of brick, the portion which extends above the roof being likewise surfaced with cement. Near one of the front corners is a basement, 18 by 19 ft. in dimensions, including the wall thicknesses, which is both walled and floored with concrete. The base thickness of the foundations of the porch and pergola is 18 in., and of all other outside-line foundations, as well as of all piers, it is 16 in., while the inside walls of the basement are 14 in. thick at the base. Excluding a ¾-in. layer of Portland cement as a top dressing, the porch and pergola have floors 4 in. thick, and the basement a floor 3 in. thick. All concrete work is composed of one part cement and five parts sharp sand and coarse gravel.

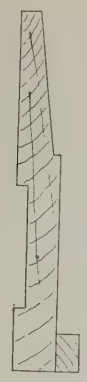


SIDE AND REAR VIEWS OF CHALET BUILT BY A. S. BARNES AT LOS ANGELES, CAL.—PORTION OF THE GARAGE IS SEEN AT THE EXTREME RIGHT

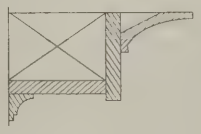
The exterior wall covering from the base-course upward, except in the two end gables, consists of sawed Redwood shakes, 6 in. wide and 36 in. long, spaced about 1 in. apart, and laid with approximately 15 in. exposure to the weather. The front and rear gables—the former extending down to the second-floor line and the latter to the top of the



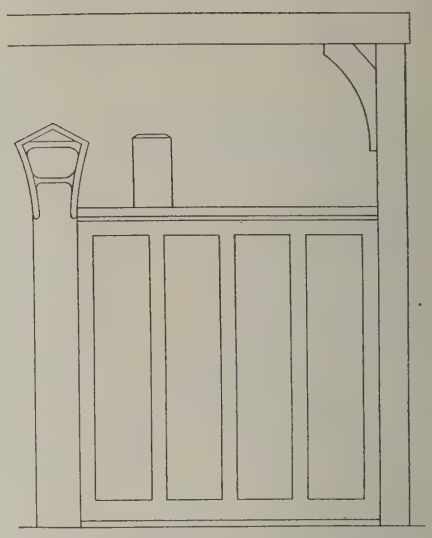
Foundation Plan—Scale 1/16 In. to the Foot



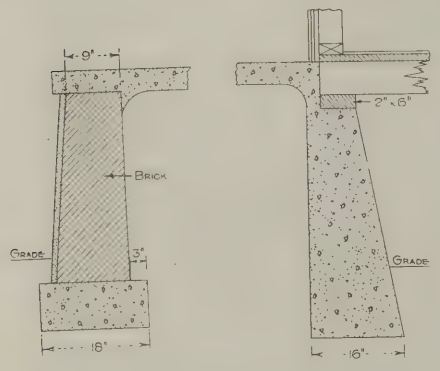
Base — Scale 3 In. to the Foot



Detail of Wood Cornice—Scale 1 In. to the Foot



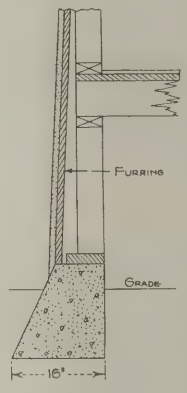
Detail of Cased Opening to Stairway—Scale ⅜ In. to the Foot



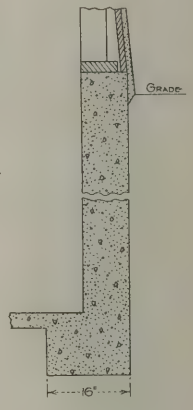
Sections Through Foundation Walls on Lines A-A. Scale ⅜ In. to the Foot



Section on Line B-B

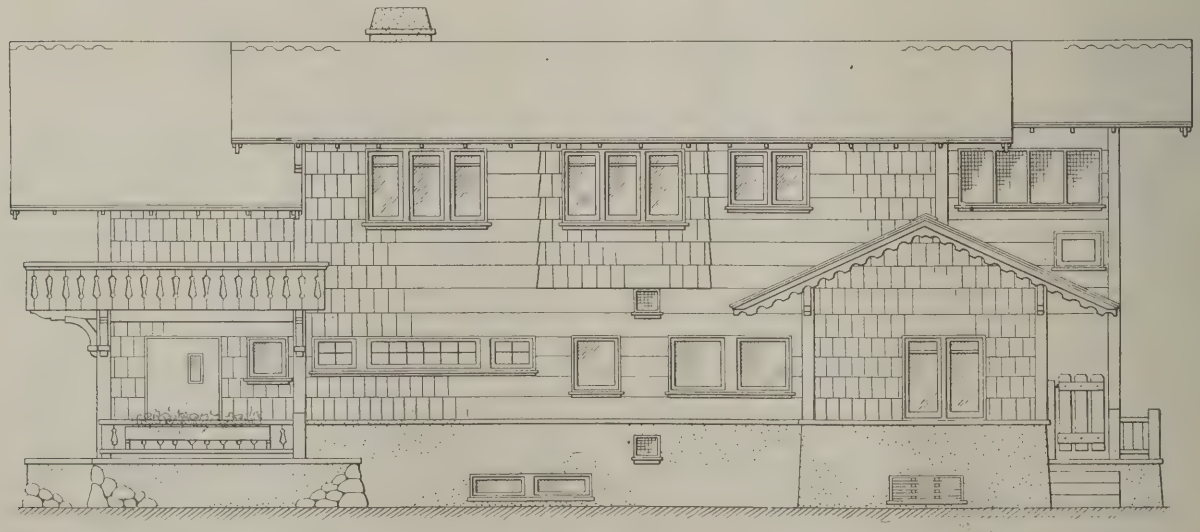


Section on Line D-D



Section on Line E-E

Scale ⅜ In. to the Foot



The Right Side Elevation Showing High Windows Over Buffet in the Dining Room—Scale 3/32 In. to the Foot

PLANS, ELEVATION AND MISCELLANEOUS DETAILS OF CONSTRUCTION

upper windows—are vertically boarded with 1 x 8 in. Redwood, spaced about 1 in. apart, the side walls of the loggia being of similar design. Save for the extreme upper part of the gables, where vents are provided—which comprises the whole of the rear one—these vertical-set boards are battened on the inside, and those of the vent portion of the front gable have band-sawed edges.

The roofs, which are irregularly designed and pitched, are covered with 16 in. cedar shingles, exposed 4 in. to the weather. Interesting details of the roof are the verge and ridge boards, with their scalloped edges, and the brackets underneath the gable extensions, as shown in the detail drawings.

The balcony is supported by the 8 x 8 in. porch columns, which are bracketed like the roof extensions; and its wood flooring, like that of the loggia, is covered with 16-ounce canvas imbedded in white lead and painted with waterproof paint. The railing of this balcony, as well as of the front porch and the rear pergola, is constructed of vertical-set, band-sawed boards, of 1 x 10 in. material. A flower box comprises an enhancing feature of the end section of the porch railing, and a similar flower box is located beneath two of the front windows.

The floor arrangement is not only unusual but also decidedly convenient as may be seen from the plans. The front door, paneled with a small pane of beveled glass, opens into one end of the entry hall, and this hall is joined to one end of the long living room by a broad cased opening. A similar cased opening connects the latter with the stairway hall, and a sliding wood door intervenes between it and the dining room, while shut off from it in the rear by two sliding glass doors is the sun room, which in turn, has French doors opening into the rear pergola. Adjoining the stairway hall is the rear hall, off of which is a small first-floor lavatory and which, by a glass door, gives access to the kitchen. Back of the kitchen are the servant's room and screened porch, the latter possessing another toilet room. From the pantry, between the kitchen and dining room, lead the stairs to the basement.

Each of the three bed rooms and bath room is directly connected to the second-floor stair hall; the screened sleeping room, the bath room and the dressing room are reached from the rear bed room,



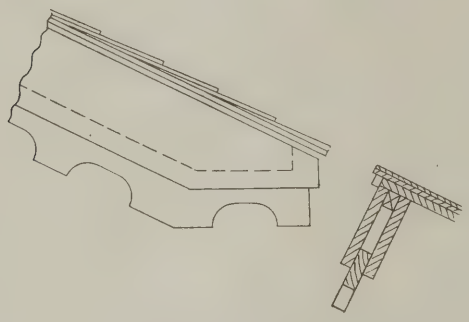
VIEW IN THE LIVING ROOM OF CHALET BUILT BY A. S. BARNES AT LOS ANGELES

and the boudoir and the loggia are accessible from the front bed room. A cased opening connects the rear bed room and the dressing room, and double glass doors are used between the front bed room and the loggia.

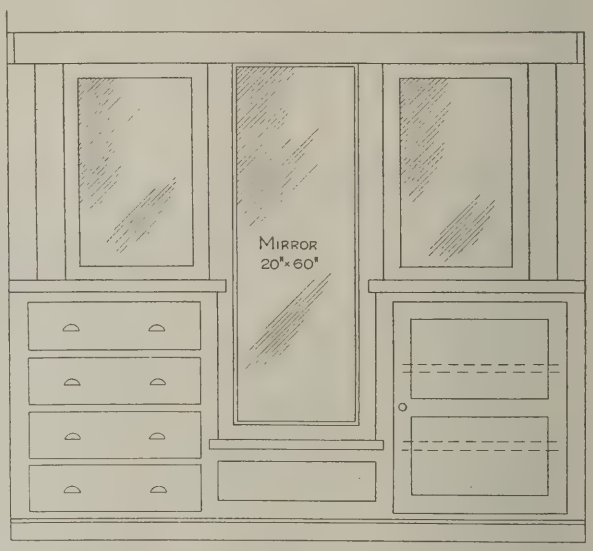
The entry hall and living room have a combined length of 34 ft. 5 in. and a width of 17 ft. 6 in. At either side of the cased and bracketed opening between these rooms is a 27-in. bracketed opening, above a sort of buttress effect; and a similar opening, on one side of the living room, helps in lighting up the stairway. In one end of the entry hall is a built-in seat, while an L-shaped book-case, with shelves for four rows of books and equipped with glass doors, is a feature of one corner of the living

room, above one angle of which is a small art-glass window looking onto the front porch. This room also contains a large square-lined fireplace, constructed of old-gold brick, with a wood mantel-shelf. The room's woodwork is of pine, finished in mahogany color, and the plastered walls are covered with grass cloth of a deep cream shade. The ceiling is finished with a wood cornice. The woodwork of the stairway hall and the staircase is finished to correspond with that of the living room.

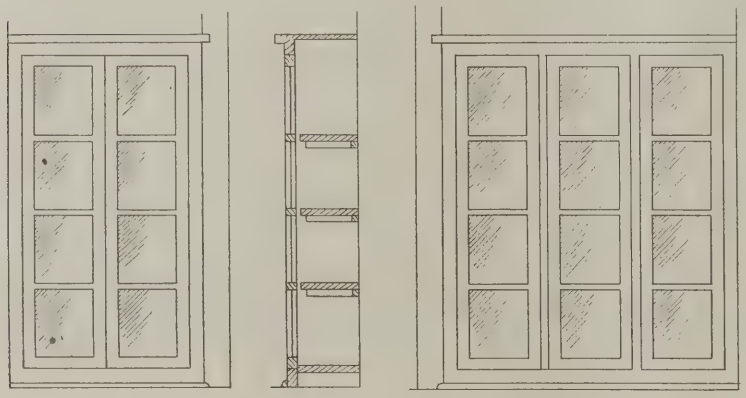
The sun room, well lighted by windows and glass doors, contains two small book-cases at each side of the entrance from the living room. These book-cases, with their top counter-shelf, reach to a height of approximately 5 ft., one section being provided with three glass doors and the other with two. The pine woodwork of this room is treated with Johnson's wood dyes so as to possess a soft olive-green shade, and the wall paper and the window drapes are flower patterned. The ceiling of this room is finished with a broad, deep cove.



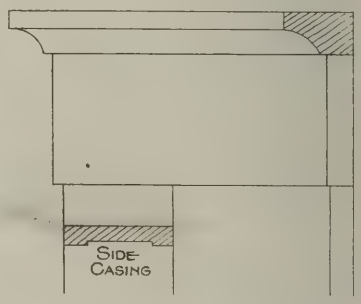
Partial Elevation of Verge Board and Section of Ridgeboard—Scale ¾ In. to the Foot



Elevation of Cabinet in Bathroom—Scale ¾ In. to the Foot



Elevations and Section of the Book Cases in the Sun Room—Scale ⅜ In. to the Foot



Details of Head and Side Casings—Scale 1½ In. to the Foot

The dining room has a built-in buffet, which, with its end china closets, occupies one entire end of the room, with a number of small windows above. A detail drawing of this feature is shown on another page. This room is finished with a paneled wainscot of attractive design, with a plate rail above, and a wood cornice finishes the ceiling, details of which are also here shown. The woodwork here is of pine, finished to resemble mahogany, to correspond with the living room, and the wall paper is of dull blue.

The woodwork elsewhere on the first floor is of selected Oregon pine enameled white, and the walls are plastered and tinted. In the kitchen, however, the walls, to a height of 6 ft., are finished with smooth-surfaced, hard wall plaster, which is lined off into 6-in. squares and enameled white like the woodwork. The pantry contains convenient cabinet shelves and counter-shelf; the kitchen has an abundance of built-in cupboard space, including shelves and drawers, a flour bin and a bread board, as well as a woodstone sink. The rear screened porch has two laundry tubs, with a hinged covering which comprises an excellent table when lowered; and the rear hall contains both a coat and a broom closet.

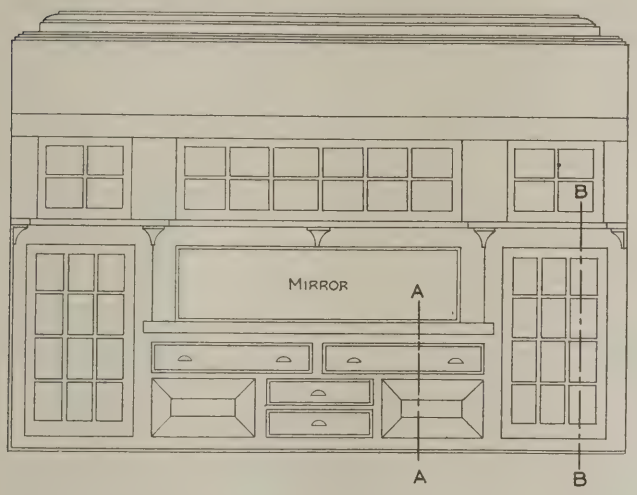
The woodwork on the second floor is of pine enameled white, except in the screened sleeping room, where it is stained a soft green; and the walls of the two main bed rooms are papered, which also includes the boudoir and the dressing room. Elsewhere the plastered surfaces are tinted, except in the bath room, where the walls are finished to a height on line with the top of the doors and windows with hard wall plaster and enameled.

On account of the space being considerably cut into by the slopes of the roof, the second floor

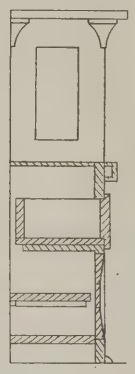
arrangement is made to possess a great deal of storage and closet space. On one side of the floor plan, for instance, will be seen two large spaces marked "storage"; and the ceiling of one of the bed rooms, for the same reason, is necessarily made 6 in. lower than in the other bed rooms, while the ceilings of the boudoir, dressing room and two of the closets are likewise interfered with.

The front bed room has a particularly large closet, which occupies the space at one side of the loggia; and the boudoir reached from this room, making a combination of built-in features extending the full width of one of the end walls and embracing a cabinet of drawers and a cabinet of shelves, with a window above each section, separated by a box seat and a tall plate-glass mirror. A detail drawing of this feature is shown among the illustrations.

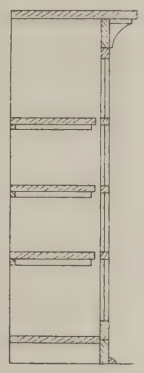
Hardwood flooring is used throughout—oak on the first floor and maple on the second—except in the kitchen and rear screened porch on the first floor and in the bath room and screened sleeping room on the second floor. The bath room has tile flooring,



Elevation of Buffet and China Closet in the Dining Room—Scale ¼ In. to the Foot

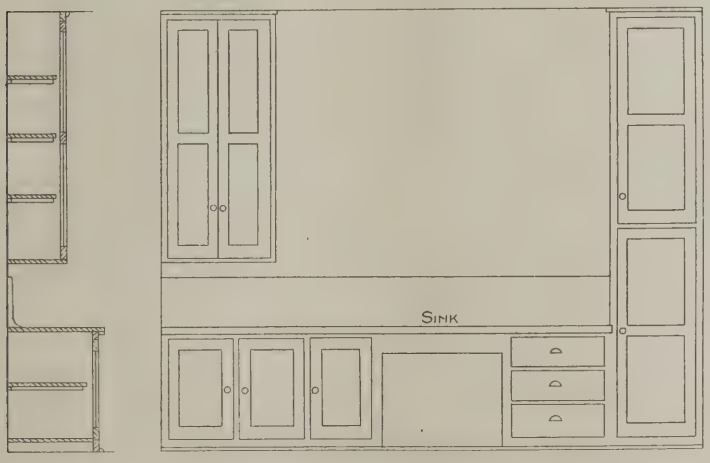


Section of Dining Room Buffet on Line A-A



Section of China Closet on Line B-B

Scale ⅜ In. to the Foot



Elevation of Sink Cupboards and Cooler in the Kitchen with Vertical Section of Cupboard—Scale ¼ In. to the Foot



Section and Elevation of Flour Bin and Cabinet in the Kitchen—Scale ¼ In. to the Foot

use of the space at the other side of the loggia, contains a convenient chest of drawers, which is built into a side wall so as to project into the adjoining storage area. The rear bed room contains a small medicine case, built into the wall; also a wash bowl, and the dressing room adjoining this bed room possesses a large clothes closet, the door of which is paneled with a full-length plate-glass mirror. The remaining bed room also has a roomy closet, and in the upper stairway hall is an excellent linen closet. The bath room contains, besides the usual fixtures, and in the other rooms pine is used, the floor of the kitchen being covered with linoleum.

The framing timbers of the house consist mainly of California redwood. The sills are 2 x 6 in., with 4 x 6 in. girders. The sills are halved and nailed together at the corners. The posts are 4 x 4 in. material. The first floor joists are 2 x 8 in.; the second floor joists, 2 x 10 in., and the ceiling, or third floor, joists, 2 x 4 in., all spaced 16 in. on centers. They are doubled under partitions and around openings for stairways, chimneys, and so forth. The

joists over the front porch and extending as partial support to the balcony, however, are 2 x 8 in., spaced 24 in. on centers. The studs and plates are 2 x 4 in. and the rafters 2 x 6 in., also spaced 16 in. on centers. All framing is diagonally braced with 2 x 4 in. material cut in between studs, and the floor joists are braced with 1⅛ x 2 in. herring-bone bridging.

The exterior of the framing is sheathed with 1 x 8 in. matched and surfaced Oregon fir, laid diagonally; and all floors, except where pine is used, are laid over a sub-floor of 1 x 6 in. Oregon fir.

All outside finish of 1-in. material or less, except the ½-in. thick shakes, is of No. 1 Oregon pine, or fir, and all timbers exteriorly exposed of greater than 1 in. in thickness are of California Redwood. These timbers, including the vertical-set gable and railing boards, are left rustic, or unsurfaced. This, however, does not apply to the window and door frames, which are surfaced.

The exterior of the house, except for the roof and the slight trim about the windows, is painted a dark green color. The shingles are stained a very dark gray, and the window trim is of light cream.

Many of the windows are of the casement type, designed to open toward the interior.

The house is heated by a hot-air furnace, the piping being concealed in the partitions and covered with asbestos. The plumbing is complete and modern in the matter of convenience, and includes a standard grade of fixtures. Electric wiring and gas connections complete the equipment.

This attractive and practical interpretation of the chalêt style of architecture is located in Los Angeles, calif., and was built by A. S. Barnes, Union Oil Building, of that city, in accordance with plans prepared by Architect E. B. Rust, Van Nuys Building, Los Angeles, Cal.

The total cost, including a small garage of a style to correspond with the house, as well as all cement walks, was approximately $5,800.

BUILDINGS FOR THE BRONX INTERNATIONAL EXPOSITION

The buildings for the permanent exposition and amusement resort which is to be opened the coming summer at East 177th Street and the Bronx River, N. Y., will occupy a site of 25 acres. Plans for two of the seventy-seven buildings to be constructed were filed a few days ago, one being the convention hall to seat 15,000 people and the other a bathing pavilion. The latter will have a large salt-water swimming pool 300 x 360 ft. in area and will be three stories high with a grandstand on the roof. It will have 4400 dressing rooms, giving accommodations for 5000 people at one time.

The swimming pool will have a beach 50 ft. wide by 300 ft. long, and surrounding it to the east, west and south will be a promenade, slightly elevated above the surface of the water. On the south side there will be a miniature Niagara Falls, 180 ft. in diameter and 46 ft. in height, illuminated from within and without by colored incandescent lights. A short distance in front of the falls will be a diving tower 150 ft. high with balconies every 10 ft. so that the divers may select their heights from which to plunge. The bathing pavilion is estimated to cost $75,000 and the convention hall $65,000, the architecture of the latter being Spanish Colonial. The plans were filed by Kenneth M. Murchison, 298 Fifth Avenue, New York, the architect for the Bronx International Exposition.

OFFICERS OF NORTH SHORE MASTER BUILDERS' ASSOCIATION

At the annual meeting of the North Shore Master Builders' Association, held in the rooms of the Chamber of Commerce, Salem, Mass., on Feb. 1, the officers for the ensuing year were elected as follows:

President	Robert Robertson
Vice-Presidents	Archibald Morison
	George Sinnicks
	V. S. Peterson
Secretary	R. E. Hodgkins
Treasurer	J. R. Pope

There were also elected four directors and the outlook for the building season was discussed.

COST OF BUILDING CONSTRUCTION

In testifying as to the great increase in the price of building materials during the last two years, a witness before the Public Utilities Commission, Washington, D. C., early in December, stated that "structural and ornamental steel has advanced 175 per cent; brickwork has gone up 20 per cent; stonework, 15 per cent; lumber, 15 per cent, with increases in every other element entering into the construction of the building."

Representatives of the General Electric and Westinghouse companies who appeared before the same Commission stated that prices of materials have increased during the past two years from 15 to 400 per cent.

LICENSING ARCHITECTS IN OREGON AND WASHINGTON

A movement is on foot among the architects of Oregon and Washington to secure legislation restricting the use of the title "Architect." It is not intended to prevent the owner, engineer, draftsman, or designer from preparing drawings for prospective structures, but merely to restrict the title to those whose experience warrants the honor.

In the new building ordinance just adopted by the city of New London, Conn., it is provided that "concrete for reinforced construction shall consist of a wet mixture of one part Portland cement to not more than six parts of aggregate fine and coarse in such proportions as to produce the greatest density."

A MODERATE COST BRICK GARAGE

VARIOUS INTERESTING DETAILS OF CONSTRUCTION TOGETHER WITH FIGURES OF ACTUAL COST

THE subject of the garage for the housing of the private motor car is one which is receiving more and more consideration at the present time and builders all over the country are greatly interested in features of construction and particularly in actual figures of cost. They will, therefore, find in what follows much to command their attention as the figures given are taken from actual work and the contractor states that they will be found a reliable guide in many parts of the country. The drawings presented herewith relate to a brick garage 17 x 22 ft. in plan and which cost to build less than $600. The work was done by William H. Welsh, general contractor and builder, 145 Decatur Street, Corning, New York, who furnishes the following data and figures, which we are sure will be appreciated.



BRICK GARAGE DESIGNED AND BUILT BY WILLIAM H. WELSH, CORNING, N. Y.

There seems to be a general opinion among the majority of people that the cost of a brick building of any description is nearly double that of one constructed of any other material. The brick work of the garage here illustrated including face brick, chimney and cesspool, will cost $165, or if we use common brick for the facing, the cost will be $139. If we use partition tile 8 in. thick it will be necessary to plaster it on the outside which at the present price of tile and cement will make the cost fully as high as brick.

If we consider the best wood construction, using plates and sills with studs placed 16 in. on centers, covering these with 7/8 in. sheathing, No. 1 siding, and then add for building paper, two coats of paint outside and two coats of plaster inside, the cost will be about $112. If we want a heater in the garage we shall have to build the chimney from the floor at a cost of $12, making a difference of about $15 less than walls of common brick. By using brick or tile and putting in a steel ceiling, we have a garage that is very nearly fireproof and one in which there is very little woodwork that will need painting.

Itemized Cost of Brick Garage

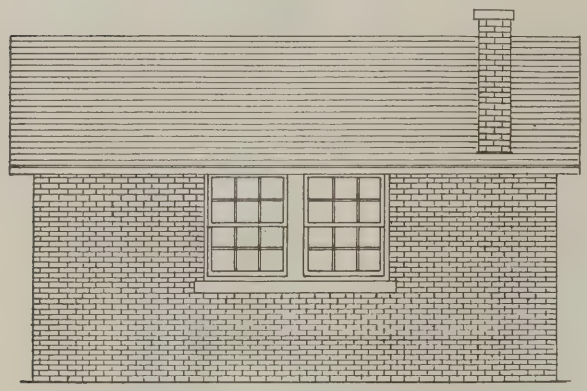
The following figures of cost of labor and various material may prove interesting in this connection:

Excavating (cesspool, 4 yd.; trenches, 10 yd.), 14 yd., @ 60c	$8.40	
Concrete foundation (in trenches), 10 yd. @ $5	50.00	
Concrete floor, 345 sq. ft., @ 15c	51.75	
6 yd. cinder fill tamped in place	5.50	
18 lin. ft. 3 in. sewer pipe in place	2.52	
20 lin. ft. concrete window sills	6.00	
Cesspool	17.00	
		$141.17
3,600 face brick @ $16.00	$57.60	
3,400 common brick @ $8.50	29.80	
Wall ties	2.00	
Mortar	14.00	
Bricklayer and laborer	56.00	
Catch basin complete	7.00	
		165.50
Carpentry:		
34 pc. 2x4 in. x 12 ft., 272 B.M.		
5 pc. 2x8 in. x 16 ft., 107 B.M.		
7 pc. 2x6 in. x 16 ft., 112 B.M.		
Roof boards and sheathing, 630 B.M.		
1121 B.M., @ $27.50	$30.85	
Carpenter labor	17.00	
		47.85
5 windows, 12 lts. 12x12 in., @ $2.50	$12.50	
2 mullion frames, @ $4.40	8.80	
1 single frame	2.30	
1 rear door and transom	5.50	
1 rear door transom frame	2.75	
2 gable windows with frames	4.20	
4 garage doors, @$10.00	40.00	
1 frame for opening 10 ft. 10 in. x 9 in.	3.20	
Plain 4 in. casing for doors and windows	3.50	
120 ft. B.M. cornice lumber, @ $45.00	5.40	
Lock, butts, etc.	7.70	
Carpenter work on above	19.60	
6 squares slate surfaced shingles in place	40.50	
		155.95
Nails, screws and bells	$2.50	
3¼ squares plain steel ceiling, @ $7.00	23.00	
Painting	11.00	
Carting, insurance and miscellaneous	22.00	
		58.50
Total		$568.97

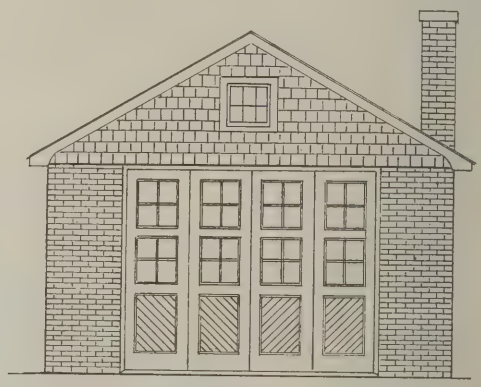
It may be interesting to state that the above figures do not include the builders' profit.

The garage here shown has walls of brown mottled brick laid up with ⅜ in. joints, the gables and roof being covered with red slate-surfaced shingles. Those on the gables have fancy butts as will readily be seen from an inspection of the half-tone illustration. All the exterior woodwork is painted a dark green.

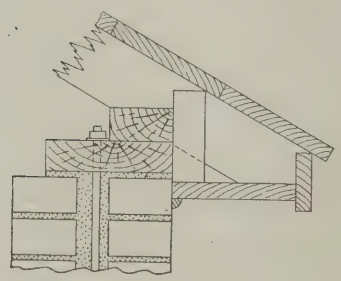
The doors swing in and at the jambs have four butts, the center doors having three butts each. I use a store door lock as it looks better and is easier to handle with gloves than a knob.



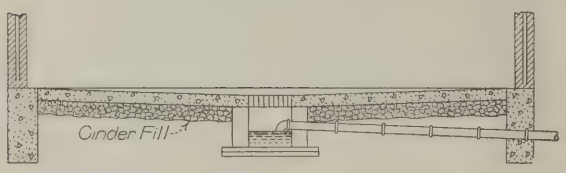
Right Side Elevation—Scale ⅛ In. to the Foot



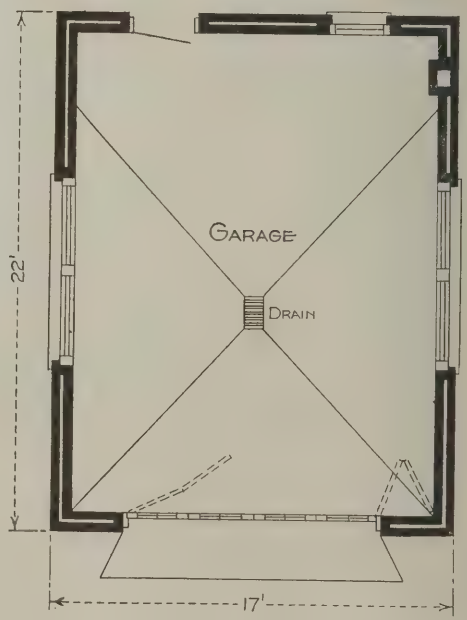
Front Elevation—Scale ⅛ In. to the Foot



Detail of Main Cornice—Scale 1 In. to the Foot



Cross Section Through the Floor Showing Drain and Connection. Scale ⅛ In. to the Foot



Floor Plan—Scale ⅛ In. to the Foot

The floor has a fall if 1½ in. to the catch basin, which is built entirely of brick, the wall being corbelled in to 6 in. at the top and the grating being formed with brick on edge, with half-inch tile spreaders at the end. The brick grating can be easily taken out for cleaning and there is much less danger of breaking and cracking than there is with the ordinary floor drain.

There is ample room for a heater and work bench and also sufficient space to take care of a large car or two moderate priced cars may be housed in case of emergency.

THE CONSTRUCTION OF CONCRETE BUILDINGS

THE SAFEGUARDING OF LIFE IN THE ERECTION OF REINFORCED CONCRETE BUILDINGS—USING CONCRETE IN WINTER*

BY ERNEST MCCULLOUGH†



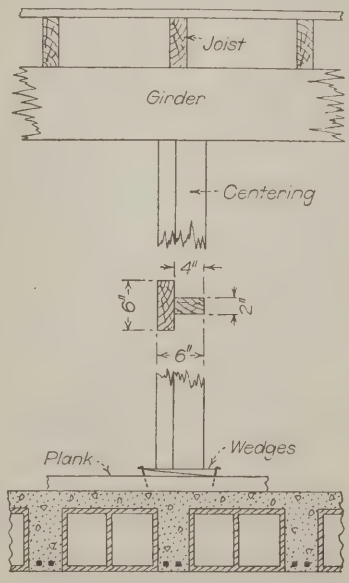
WISE economy in using "forms" is commendable. Foolish economy is criminal. A proper supervision of this very important item in the erection of reinforced concrete buildings is not always exercised and the loss of life in consequence is sometimes very great. A person would think that bent centering indicates weakness, but too many men do not regard it as dangerous, saying "When the concrete sets the pressure will be relieved." They do not know, or perhaps fail to realize, that while the centers are bending the concrete is moving, and during this time it is also setting and hardening. Reinforced concrete owes its strength to the bond between the concrete and steel, and a perfect bond cannot be obtained if there is any disturbance or movement of the materials during the three hours following the filling of the forms.

It is not uncommon to see centers 10 ft. long bent in a bow having an ordinate of 7 or 8 in. Architects permitting this should have their license taken away. Inspectors on such work should be discharged and contractors using such methods should not be bonded by surety companies.

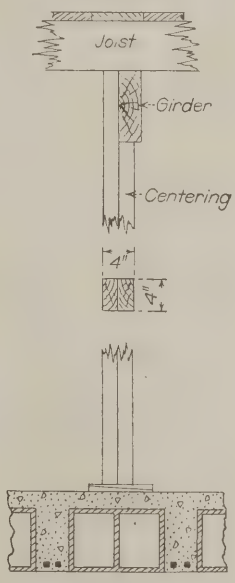
It is not uncommon to see two 2 x 4-in. pieces spiked together to make one 4 x 4-in. post. Men who understand the most elementary facts about column design know that such construction is bad. To see it on any job advertises the incompetency of the architect and his inspector, who are supposed to know such things. The ratio of slenderness fixes the strength of a column. For example, in the Chicago Building Code a short block of white pine can be used with a safe fiber stress of 800 lb. per sq. in. If the length divided by the *least* thickness equals 15, the safe fiber stress is 596 lb. per sq. in. If the length divided by the *least* thickness equals 30, the safe fiber stress is 437 lb. per sq. in. Assume a post 4 x 4 in. square and 5 ft. long, the ratio is 30 and the safe fiber stress is 437 lb. per sq. in., and the total safe load will be 16 x 437 = 6992 lb.

If two 2 x 4-in. pieces are spiked together we really have two posts, each 2 in. thick, so the ratio becomes 60. Long experience has shown this to be dangerous, and 30 is the limit set for wood. Experiments have proved that two pieces fastened together in this manner do not act together. If the load is not so distributed that each piece carries exactly one-half then one piece may be nearly gone before the other piece begins to help. It is impossible to use enough nails to make them act together as one piece.

Two 2 x 4-in. pieces should be spiked together in T shape. The least width is 4 in., and this should be used in figuring the slenderness ratio. One 2 x 4-in. forming a T with one 2 x 6-in. makes a post having a least thickness of 6 in. Similarly, one 2 x 6-in. forming a T with one 2 x 8-in. makes a post have a least thickness of 8 in. If the pieces are not fastened together with 20d., or longer, nails or spikes 6 in. on centers they will not act



Good Practice—Center Loading of the Stiff Vertical Supports: Post Resting on Plank Which Distributes Load



Bad Practice—Eccentric Loading of the Timber Vertical Supports: Posts Resting on a Thin Slab

*Abstract of article in 23rd Annual Report Chief State Factory Inspector for Illinois.

†Chief Engineer of the Fireproof Construction Bureau, Portland Cement Association.

properly as one piece. When properly made such posts have about 90 per cent of the strength of solid pieces of the same width and area.

It is not uncommon to see the ends of posts resting directly on concrete floors, thus concentrating great weight on a small area. Occasionally a piece of wood 1 ft. square is used under the post. This is especially bad when the floors consist of small concrete joists with tile or metal between, with very thin slabs of concrete covering these tile or metal forms. Holes have been punched through such floors many times by centers and posts under floors above.

CENTERS TIED TOGETHER

Centers should be tied together in four directions so their greatest length will be no more than 30 times the least thickness. They should be vertical. The girders they carry should be positively over the center. They should be full length and no blocks should be used at the lower end, for such blocks can be, and often are, knocked out. If wedges are used they should be double and as thin as possible. Under all posts planks should go clear across the floors to distribute the load. Spacing of centers at intervals of more than 6 ft. should not be allowed, for greater spacing will cause too heavy concentrations on the floors.

Slab forms usually consist of a platform of boards carried on joists and these joists are carried on girders, which in turn are carried by the posts, which are called centers. Tables are presented here fixing minimum sizes and maximum spacing of joists, girders and centers. In order to utilize the material carried by local lumber dealers a choice is given of sizes in all tables. For convenience of reference Table 1 contains a description of the slabs with a number given to each slab. Reference is made to slab numbers in the tables following instead of to slab thickness.

Several planks of the same wood used as beams may be spiked side by side and they will act as a solid piece, in this respect differing from piece placed vertically and loaded on the end.

TIME FOR CENTERS TO REMAIN IN PLACE

In pouring floors of buildings lumber should be provided for not less than three floors when the temperature is above 50 deg. F. When the temperature is lower than 50 deg. F. the amount of centering and forms must be increased.

When forms are removed from slabs, beams, girders and columns one-half of the centers must be put back and remain in place not less than a week to permit the concrete to dry out and harden.

When the outside temperature is above 60 deg. F. wall and column forms may be removed within seventy-two hours and the side forms may be removed from beams and girders the following day. Forms under bottom of slabs, spans of 6 ft., or less, should remain in place four days, plus day extra for each additional foot of span. Bottom of beams and girders less than 14 ft. span, fourteen days, plus one day for each additional foot of span.

When the average outside temperature during the period of setting is between 50 deg. F. and 60 deg. F., add four days time for underside of slabs, beams and girders, and two days for columns and sides of beams and girders. When the outside average temperature during period of setting is between 40 deg. F. and 50 deg. F., and the interior temperature has not fallen below 40 deg. F., do not remove forms from columns and the sides of beams and girders under ten (10) days. Forms to remain under slabs and on bottom of beams and girders for not less than two weeks. When the average temperature falls below 40 deg. F. the forms shall not be removed until careful tests show the concrete is set and is not frozen.

TO TEST CONCRETE FOR FREEZING

Only one test is of value to determine whether concrete is frozen and this is by using hot water. The water should have a temperature of not less than 150 deg. F. and should not be boiling. A piece of frozen concrete immersed in hot water of this temperature will soften in from three to four minutes. To test a floor, construct a tight dam to enclose an area several feet square, and keep 4 in. of hot water on it. If the floor does not soften in half an hour the concrete may be considered safe. The water will rapidly cool down when thus applied, but if at the end of half an hour it is still warm the desired result will be obtained. Water having a temperature of 70 deg. F. is just as effective for making the test but is slower in results, sometimes requiring several hours to thaw the concrete and bring out the frost. Deluging suspected concrete by hose for half an hour with hot water has proved effective. Boiling water may remove the frost and immediately start the setting action and so give false results.

TABLES FOR FORM WORK

The following tables should be followed in constructing "forms" and erecting centering.

No. 1—Table of Slab Numbers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Slab Thickness in Inches																
Solid slab...	3	4	–	–	5	–	—	6	—	7	—	8	—	9	10	11	12
Combination tile and concrete	–	6	7	8	–	9	10	11	12	13	14	—	15	—	—	—	—

No. 2—Table of Posts for Centering

3″ × 4″	braced in four directions every 7 ft. To be spaced 4′ 0″ × 4′ 0″ or less under slabs 11, 12, 13, 14, 15, 16, 17 and 4 ft. apart under girders or beams. To be spaced 4′ 0″ × 6′ 0″ or less under slabs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
4″ × 4″	or 2″ × 4″ + 2″ × 4″ T, braced in four directions every 8 ft. To be spaced 4′ 0″ × 6′ 0″ or less under slabs 11, 12, 13, 14, 15, 16, 17, or 5 ft. apart under girders or beams. To be spaced 6′ 0″ × 6′ 0″ or less under slabs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
6″ × 6″	or 2″ × 4″ + 2″ × 6″ T braced in four directions every 8 ft. To be spaced 6′ 0″ × 6′ 0″ or less under slabs 12, 13, 14, 15, 16, 17, or 6 ft. apart under girders or beams.

It is important that the above requirements for length of posts be observed. They may be of any length to conform to clear height but must be tied in four directions so the greatest length from end to tie shall be not more than above stated. The

ties may be horizontal or diagonal and should be well secured by nailing.

It is important that the posts rest at the lower end on a plank, in order to distribute the load over the floor. Use a 2 x 12-in. for spacing of 4 x 4 ft.; a 3 x 12-in. for spacing of 4 x 6 ft. and 4 x 12-in. for spacing of 6 x 6 ft. These planks are paralled with and directly under the girders carrying the joists.

Posts must be full length and must not be used with blocks under the lower end. Wedges when used should be in pairs and thin. Do not drive nails through wedges, for this interferes with adjustment. To prevent wedges working loose drive a nail into the plank or fasten a block to the plank, bearing against the heavy end of each wedge.

Care should be taken to have posts as nearly as possible directly over posts below in a vertical line from story to story.

All posts should be plumb. This is important.

No. 3—Table Showing Size and Spacing of Joists on 4-foot Span

Slab No.	Size, In.	Spacing, In.	Slab, No.	Size, In.	Spacing, In.
1	2 x 4 2 x 6	16 24	16	2 x 6	21
2 to 15 inclusive	2 x 6	24	17	2 x 6	21

No. 4—Size and Spacing of Joists on 6-foot Spans

Slab No.	Size, In.	Spacing, In.	Slab, No.	Size, In.	Spacing, In.
1, 2	2 x 6 2 x 8	16 24	7, 8	2 x 6 2 x 8	12 24
3	2 x 6 2 x 8	15 24	9, 10, 11 12, 13	2 x 6 2 x 8	12 21
4, 5, 6	2 x 6 2 x 8	14 24	14 15, 16, 17	2 x 8 2 x 8	21 18

Flooring over joists may be ⅞ in. thick (1 in. dressed) on spans of less than 21 in. It must be a full 1 in. (1¼ in. dressed) on spans of 21-in., and 24-in.

No. 5—Table of Minimum Sizes of Girders Across Posts on 4-ft. Span. Span of Joists 4-ft. or 6 ft.

Slab No.	Sizes, In.	Slab No.	Sizes, In.
1, 2	2 x 10, 3 x 8 or 4 x 6	15	3 x 10, 4 x 8 or 6 x 6
3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	2 x 10 or 3 x 8	16	3 x 10 or 4 x 8
14	2 x 10, 4 x 8 or 6 x 6	17	2 x 12, 3 x 10 or 4 x 8

No. 6—Table of Minimum Sizes of Girders Across Posts on 6-ft. Span. Span of Joists 4-ft. or 6-ft.

Slab No.	Sizes in Inches
1	2 x 12 or 3 x 10
2, 3	3 x 12, 4 x 10 or 6 x 8
4, 5, 6, 7, 8, 9	2 x 14, 3 x 12, 4 x 10 or 6 x 8
10	2 x 14, 3 x 12, 5 x 10 or 6 x 9
11	3 x 12, 6 x 9 or 7 x 8
12, 13	3 x 12, 5 x 10, 6 x 9 or 7 x 8
14	4 x 12, 5 x 10 or 6 x 9
15	3 x 14, 4 x 12, 5 x 10, 6 x 9 or 8 x 8
16	2 x 16, 2 x 14, 4 x 12, 5 x 10, 7 x 9 or 8 x 8
17	2 x 16, 3 x 14, 4 x 12, 6 x 10 or 7 x 9

Girders may be composed of several boards or planks side by side, care being taken to accurately size the pieces over bearings so they will act together. They should be spiked together and if 1-in. lumber is used with heavier stuff the thinner pieces should be inside.

When the outside temperature falls below 50 deg. F. during the day or within an hour after quitting time, the building should be enclosed.

When the temperature falls as low as 40 deg. F. salamanders, or some other heating method, should be installed in the building, and under no circumstances should the temperature within the building be permitted to fall below 40 deg. F. while the forms and centers are standing.

When the temperature falls below 40 deg. F. the contractor shall heat the water, sand and coarse aggregate and guard carefully against allowing frost or pieces of ice or lumps of frozen material getting into the concrete.

The amount of water used during cold weather must be reduced and concrete deposited in forms must feel warm to the hand.

The use of concrete with so much water that it resembles the consistency known as "soupy" or "sloppy" should not be tolerated. The ideal consistency should be no softer than medium soft tooth paste and the maximum amount of water should not exceed six (6) lb. per cubic foot of cement, sand and coarse aggregate.

STRIKES AND LOCKOUTS IN 1916

According to data compiled from various sources by the United States Bureau of Labor Statistics, the number of strikes and lockouts during the year of 1916 was 3323, as compared with 1229 in 1915. The greatest number in 1916 occurred in May, when there were 508, as compared with 122 of the same month in 1915. The lowest number was in December, when 113 occurred, as compared with 82 in the same month in 1915. Of the total number of strikes occurring in December last 29 were in the building trades and included 7 strikes of carpenters and 7 strikes of electricians. The woodworkers' strikes totaled 16.

AKRON BUILDING SHOW

A real estate and building show something after the nature of the Complete Building Show held in Cleveland early last year is being planned by the Akron Real Estate Board of Akron, Ohio, to be held March 31 to April 7. Invitations to make exhibits have been extended to manufacturers of building equipment, materials and supplies. We understand that M. A. Vinson, who managed the Cleveland Building Show, will assist the Akron committee in working out the details.

ATTRACTIVE SIDEWALK SCAFFOLDING

One of the noticeable features of almost every important building operation in the business or residential section of the larger cities is an unsightly and cumbersome scaffolding over the sidewalk in front of the new structure, the idea being to protect pedestrians from injury through possible falling of any of the materials being used in the construction work. At the same time the scaffolding is made sufficiently strong to support more or less of the steel work or stone just before it is hoisted to the upper floors of the building as the work progresses.

Now and then a building contractor demonstrates the fact that this awkward and unsightly scaffold-

ing is not a necessary attribute to the construction of the building. It goes without saying that the scaffolding is necessary in order to protect passing pedestrians, but the unsightly portion of it can be obviated without much extra cost. With a view to demonstrating this theory, the Gilsonite Construction Company of Dallas, Texas, in executing one of its contracts constructed a lattice-work scaffolding both attractive in appearance as well as serving the purpose of protection. This company has the contract for erecting an addition to the Adolphos Busch Hotel in that city, increasing its accommodations by 225 rooms with 225 additional baths as well as spacious sample rooms each measuring 19 x 35 ft. in size.



AN INTERESTING EXAMPLE OF ATTRACTIVE SIDEWALK SCAFFOLDING

The appearance of the sidewalk scaffolding as completed may be gained from the picture presented herewith. The job office of the contractor, usually an unsightly box-like affair, hurriedly erected, has been succeeded in this instance by an office of pleasing appearance upon the side of which the design of the new building as it will appear when completed has been carefully painted.

Throughout the construction of the addition to the hotel, it is the plan of the contracting company to permit no miscellaneous gathering of building debris but to keep the entire surroundings free from the usual impedimenta of the building contractors' trade. The architects of the hotel addition were Lang & Witchell, of Dallas, Texas.

TO INSTRUCT PROSPECTIVE BUILDERS

Los Angeles building trades organizations have undertaken a campaign of education among prospective builders, in order to bring about a better understanding, guard against losses and get more satisfactory results generally. A plan worked out by the Building Dealers' Credit Association is to send a "form letter" to all owners to whom building permits are issued, setting forth briefly the provisions of the mechanics' lien law, a Standard Form of Contract and Bond, and other information, which will be instructive to persons building small homes, etc., few of whom are familiar with formal procedure in such matters. The Los Angeles Builders' Exchange, also, is doing educational work, getting business men and others interested in building activities together at noon-day meetings, giving an opportunity for discussion of many problems.

THE KIND OF FLOORS HE WANTED

"Would you like the floors in mosaic?" asked the architect.

The Springfield man looked dubious.

"Would you like the floor in mosaic patterns?"

"I don't know so much about that," he finally said. "I ain't got any prejudice against Moses as a man, and maybe he knew a lot about the law. As regards laying floors, though, I kinder think I'd rather have them unsectarian."—*Harper's Weekly.*

CONSTRUCTING A MODERN STUCCO HOUSE

VALUABLE SUGGESTIONS AND FACTS FOR THE BUILDER OF HOUSES OF THIS KIND

BY C. O. POWELL

THE growing popularity of stucco coated buildings and of dwelling houses in particular lends added interest and value to authentic data bearing upon work of this nature, and the comments which follow are intended to make clear some points in regard to such construction which now are but poorly understood. Much of the popularity of stucco for residence construction has been due to its permanence and the attractive results which are possible by its use as well as its fire-resisting character when applied over metal lath. Notwithstanding the recognition of the advantages of this type of construction by leading architects and builders the country over there are still some people who believe that stucco over metal lath is too expensive for a home costing less than $10,000.

This belief is wrongly based on the comparison between the first cost of the materials. The value of any building material or method is not what it costs at the time of the erection of the building, but rather on the ultimate cost. This cost includes the cost at the time of completing the building plus the cost of work and materials necessary for upkeep.

Taking this common sense view of the cost of stucco over metal lath, it is a most economical exterior construction for residences of every class. Stucco over metal lath will not crack, hence the cost of repairs is eliminated; it does not require painting, and at the same time it is being recognized as a fire-resisting material, hence will in the near future take a lower rate of insurance, all of which mean reduction of cost for upkeep to a minimum.

This form of construction has been subjected to a considerable amount of severe criticism because of so-called failures. No other building method is more at the mercy of the careless workman. If stucco and metal lath are used in the right way there will be no cause for criticism. There is nothing mysterious or complicated in stucco construction, as the methods followed and recognized as standard by successful builders can be easily understood and executed by any workman.



STREET ARCHITECTURE RENDERED ATTRACTIVE BY THE STUCCO HOUSE

Two types of stucco construction are in general use. In the older method, the house is erected in the same manner as the usual wood building, the stucco over metal lath taking the place of the

weatherboards or clapboards. In the newer methods no sheathing is used, the stucco and metal lath taking the place of the sheathing and clapboards.

When the stucco is to be placed over sheathing, the frame and sheathing are erected in the usual manner, the sheathing being placed diagonally to the studding. If it is put on horizontally the frame is not so well braced and a rigid frame is one of



A STUCCO COAT FOR THE SECOND STORY

the essentials for securing satisfactory stucco work.

After the sheathing is in place the whole exterior is covered with a waterproof building paper well lapped at the edges of the sheets. The purpose of this paper is to prevent the stucco from coming in contact with the wood sheathing.

If a waterproofed paper is not used the wood will draw the water from the wet stucco when it is applied. This absorption of the water will prevent the proper setting of the stucco and cause cracking. The paper also protects the sheathing from rotting.

Furring strips spaced 12 in. or 16 in. on centers are then placed vertically over the waterproofed paper. These strips are necessary to fur out the metal lath so that the plaster will flow through the meshes and form a proper key.

These furring strips are crimped steel, ½-inch wide, or pencil rods. Wood strips or a wood lath are not used because the wood will absorb moisture from the stucco and prevent the proper setting, thus causing a crack along the strip. Another disadvantage in the use of wooden furring is that the stucco cannot key to the lath where the lath touches the strip. The stucco is thus held only by adhesion.

After the metal furring has been placed, painted metal lath should be fastened on with the sheets at right angles to the furring, 1½ in. staples being used for this purpose and are placed one every four inches along the furring.

In putting on the lath, work is started at the top of the wall so that the lower sheet always laps over the one above it. The sheets are lapped ½ in. on the sides and about 1 in. on the ends. The sheets are 8 ft. long so that they work on either 12 or 16 in. centers. Joints are broken at the ends of the sheets so there will be no continuous vertical joints.

The labor and cost of metal furring is entirely done away with if a self-furring metal lath is used. This lath has small ribs ½ in. deep formed in the sheets after they have been expanded. These ribs act as furring and being open meshwork, will permit the stucco to flow through and completely embed the ribs as well as the surface of the lath.

With the lath on the building, the next step is to apply the stucco, which is done in three coats. Two-coat work will not produce the best results and is but little less in cost than the three-coat work.

The first coat is mixed in the proportions of 1 part Portland cement, 2½ parts sand and 1-3 part (in volume) of lime putty. This coat is applied with sufficient force to push it through the lath and against the waterproofed paper. Care is taken to fill all voids around the furring and at the laps of the lath. Before the initial set has begun, the surface of this coat is well scratched to insure a key for the second coat.

Good stucco cannot be secured unless the best materials are used. The Portland cement must be equal to the No. 1 standard of the Portland Cement Manufacturers' Association. The sand, crushed stone or gravel screenings must contain no pieces larger than ⅛ in. in diameter and be free from loam, clay, or vegetable or other foreign matter. It is best to have it graded from fine to coarse. The lime putty should be made from hydrated lime, secured from a reliable manufacturer. The water must be clean, free from oil, acid, strong alkalis or vegetable matter.

There are on the market several prepared stucco mixtures which are giving excellent satisfaction. These are always used strictly in accordance with the directions furnished by the manufacturer.

The second coat of stucco is mixed with the same proportions as the first and should be not less than ¼ in. thick. It may be applied as soon as the



A MORE COMPLETE COAT OF STUCCO

initial set has taken place in the first coat and before it has dried out. If the first coat has become dry, the surface is thoroughly wet so that it will not absorb the water from the second coat and prevent the stucco from setting properly. This coat is well scratched to provide a key for the third coat.

The third coat is the finish coat and is made a little richer than the others. The proportions are:

1 of Portland cement, 2 of sand and sometimes 1-3 (in volume) of lime putty. After the finish coat is applied it is kept damp by sprinkling or other methods until the cement has thoroughly set.

The attractiveness of stucco is secured in the finish coat. Various methods are employed. A smooth finish is secured by trowelling with a metal trowel. A stippled finish is obtained by patting with a stiff brush after it is smoothed off with a metal trowel. A sand coat finish is produced by rubbing with a wood float with the addition of a little sand, after the coat has partially set.

Rough cast or splatter dash finish is applied by throwing forcibly against the finish coat a mixture of 1 part cement and 2 parts sand so as to produce a uniform rough texture. This must be done while the finish coat is still wet. The "pebble dash" is applied in the same manner except that the pebbles are not mixed with cement.

Another popular finish for stucco is obtained by using instead of the sand for the finish coat, an aggregate of selected marble or granite screenings or other special material, within 24 hours after finishing smooth with a trowel, the surface is scrubbed with a stiff brush and water. This leaves the particles of marble or other material exposed. Sometimes it is necessary to use acid to cut the cement. If acid is used it must be thoroughly washed off.

If it is desired to have any of these finishes colored, the result is secured by adding to the dry cement the desired color in the proportion of 6 per cent of the weight of the amount of cement required for the mix. All of these ingredients for the colored stucco are thoroughly mixed dry until the mix is of a uniform color before adding the water.

The newer method for the construction of stucco houses was originated in New England and has proven very successful along the east coast of Massachusetts where the climatic conditions are a severe test of any building construction.

In this method the frame is erected in the usual manner for a frame house, and the wall studding braced with one row of bridging placed between the floors to make the frame rigid. At each floor level a fire stop is placed between the studding, this stop consisting of a strip of expanded metal lath the width of the studding. The ends are fastened to the studding and the lath covered with 1-in. of cement plaster. The metal lath is fastened directly to the exterior faces of the studding without using any sheathing. The studding are waterproofed or covered on the face and back to the center of each studding with waterproofed building paper. This is necessary to prevent the wood from absorbing the water from the wet stucco, also to prevent the rotting of the studding.



A STUCCO-COATED COTTAGE IN ONE OF THE PRETTY SUBURBS OF CINCINNATI

If the metal lath is the type known as a "flat lath," that is, does not have any corrugations in it, which serve to act as furring, it will be necessary to place furring strips along the face of the studding, so that the stucco will key properly at that point. If a corrugated, or self-furring expanded metal lath is used, the time and labor necessary for placing the furring will be eliminated.

The stucco is applied in three coats the same as in the type of stucco used over sheathing. The mixtures for the various coats are the same except that hair or fibre may be used in the first coat.

In addition to the three coats of stucco applied to the outside of the walls, a fourth coat is put on the back of the lath before the lath and plaster are applied to the inside of the walls.

This coat is mixed the same as the second exterior coat and is not less than ⅜ in. thick. This makes the exterior wall covering between 1½ and 2 in. thick and places the metal lath very nearly in the center of the stucco. The result is that the whole exterior stucco is a reinforced concrete slab with the metal lath completed embedded in the Portland cement stucco. It is a well known fact that there is no better preservative of steel than Portland cement concrete.

The same methods of finishing the stucco are used as described for stucco applied over sheathing.

The advantage of the no-sheathing type of stucco house is that it is more fire-resisting and permanent. If the interior plastering is applied over metal lath, there is practically no chance for fire originating within the walls or of its reaching the interior, either from the inside or outside of the house.

TENEMENT HOUSE CONSTRUCTION IN NEW JERSEY

The annual report of the New Jersey Board of Tenement House supervision of which Miles W. Beemer is secretary, shows that in 1916 plans for 556 tenements were approved providing accommodations for 6,240 families and estimated to cost $9,852,000. Hudson County led as regards number of new tenements, plans having been approved for 306 buildings with accommodations for 3,490 families. Essex County was second with 227 buildings having accommodations for 1,571 families.

SAN FRANCISCO BUILDING SITUATION

Our correspondent writing under date of February 5 says: "Notwithstanding the high prices of structural steel and of reinforcing bars, the proportion of brick and concrete buildings to frame continues to run about two to one. The contracts let for private building during January reached $1,780,000, of which brick and concrete construction amounted to $1,004,000, frame residences to $583,000 and $193,000 was credited to alterations, chiefly of brick structures. Besides this, contracts were let for about $600,000 of City, State and Federal work in the City, bringing the total up to $2,325,000.

"Building has also been fairly active in the country sections of California, frame and the smaller class of brick structures predominating. Country work will, however, be rather slow during the spring and summer according to the present outlook. The winter, so far, has been abnormally dry, and this has led to predictions of very short crops throughout the State, with consequent poor business outlook in the farming sections.

"The materials situation continues about as before, with nearly everything a little higher than heretofore. The advance in lumber which came with the first of the year, and which led to a slight checking of frame building, seems now to have been accepted and contracts for lumber of all sorts are now being placed as freely as ever. Brick and structural terra cotta show no particular change as to price, but are generally held more firmly."

DELAYS IN PERFORMING CONTRACTS

Several important legal principles that are involved in the performance of building contracts, so far as concerns the time fixed for completion, were recognized by the Court of Appeals of Maryland in the recent case of John Cowan, Inc., vs. Meyer, 94 Atlantic Reporter, 18.

The court holds that where a contractor unconditionally agreed to complete the excavation for a building by a certain time, failure to do so could not be excused because more rock blasting was required than had been expected. "The time in which the work was to be done was not made dependent upon the kind of material he had to move, and there is no provision in the contract or specifications to the effect that if in the course of the work he had to blast and move rock the time limit should not apply. . . . The specifications cautioned bidders to 'visit the site' and to 'acquaint themselves with existing conditions before submitting estimates' on the work, and the plaintiff says he examined the test hole and the drawings and specifications. If after doing so he was satisfied as to the kind of work required, and was willing to enter into a contract to complete it within a certain time without any provision to protect him from the consequences of a mistake in regard to the character of the material to be moved, he cannot, in a suit at law to recover for the work he did under the contract, avoid liability for his failure to comply with its terms by showing that the work was harder or more difficult than he had anticipated."

Nor, according to the Maryland decision, is it any valid excuse for delay in performance that there was in force a local ordinance forbidding blasting except in the night time, if that ordinance was in force when the contract was entered into.

Other points decided in the same case are that provision for payment of a specified amount for delay, as liquidated damages, will be sustained by the courts where it is impossible to determine the extent of the owner's actual damage, and that where the amount agreed upon is not unreasonably large it is no defense to liability on the part of the contractor to that amount that the owner has sustained no actual damage from the delay asserted by the latter.—A. L. H. Street.

METAL FENCES FOR TENEMENT YARDS

A movement is on foot in New York City for the abolishment of wooden fences in tenement yards and the substituting therefor of metal fences, the campaign being undertaken by the Tenement House Committee of the Charity Organization Society, 105 East 22nd St., New York City.

A HORSE BARN OF MODERN CONSTRUCTION

A BUILDING ERECTED TO SHOW WHAT CONSTITUTES A REALLY PRACTICAL HORSE BARN

By W. E. Frudden

THIS horse barn is modern in all its details and is practical for use on large farms throughout the country. It was planned and built on the College Dairy Farm by the Iowa State College, for the purpose of showing farmers of the State what could be done in the way of building a practical and modern horse barn. While some of the interior arrangements may not fit all needs, still the general plan and the use of the materials is well worth studying.

The barn in size is 32 ft. 8 in. in width by 93 ft. in length. The first-story walls are 8 in. thick, built of hollow clay building tile. The floors are of concrete and the footings are of the same material. The balance of the structure is of frame construction with asbestos shingles for the roofing material. The barn is well proportioned and attractive in appearance.



Northeast View Showing Barn During Progress of Construction

An inspection of the floor plan shows that there are fourteen single horse stalls in the building, three large box stalls, a tool room, five grain bins and comfortable, wide feed and litter aisles or alleys that make it convenient for the teamsters and men who work about the stables.

The barn roof truss affords here an open and unobstructed hay mow. The studding above the tile walls are nine feet in length with a double two-inch plate and sill. The rafters, studding, lookouts and plate braces are 2 x 6-in. stuff and all are spaced two feet on centers. The hip braces consist of two 12-in. boards nailed to each side of the hip joint. Three braces were cut from one board 20 ft. long for this purpose. The hay floor joists are 2 x 12 in., spiked to the wall studding and at the center, where the joists meet, the lap is tied together with a 2 x 6-in. cleat. The center girder is made up of four 12-in. planks supported by 6 x 6-in. posts which are 5 ft. apart and form a part of the stall partitions in the stable. The drawings clearly illustrate the framing used in connection with this modern horse barn.

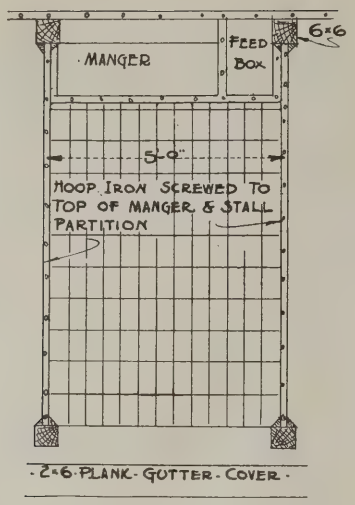
The horse stalls are made of 2-in. yellow pine planks with a strip of hoop iron around the top of the partitions and the manger and feed boxes. A detail is shown in the drawings. The floor of concrete in the stalls is covered with creosoted pine blocks set on a 2-in. sand cushion. The gutter in the horse stalls is 4 in. wide and is covered with a 2 x 6-in. plank which is flush with the floor. The liquid manure runs into the gutter and is carried away in the drains. Occasionally the plank can be removed and the gutter cleaned easily. This scheme of a gutter for horse stalls has proven popular in many sections. The barn since its completion has been thoroughly inspected by farmers from all



Southeast View Showing End Gable and One Side Elevation



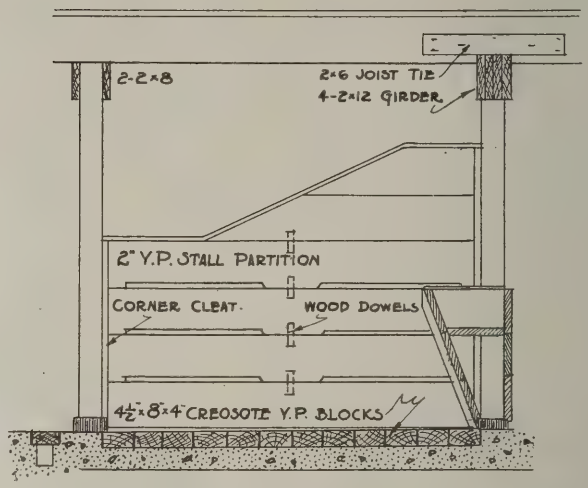
Southwest View Showing the Other Side Elevation



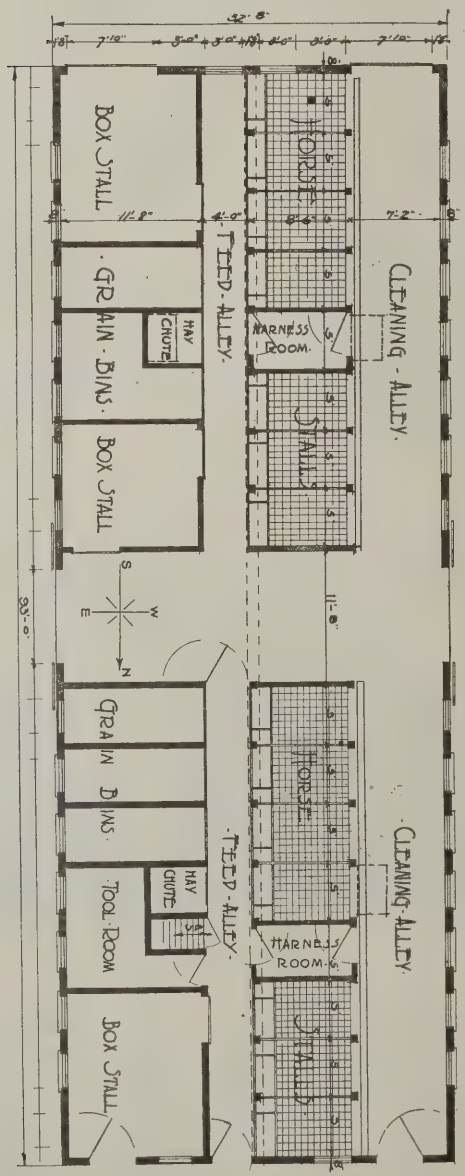
Plan of Stall—Scale ¼ In. to the Foot

parts of the State and many have carried away with them a number of ideas about building and planning a horse barn that is entirely modern in its arrangement, construction and equipment.

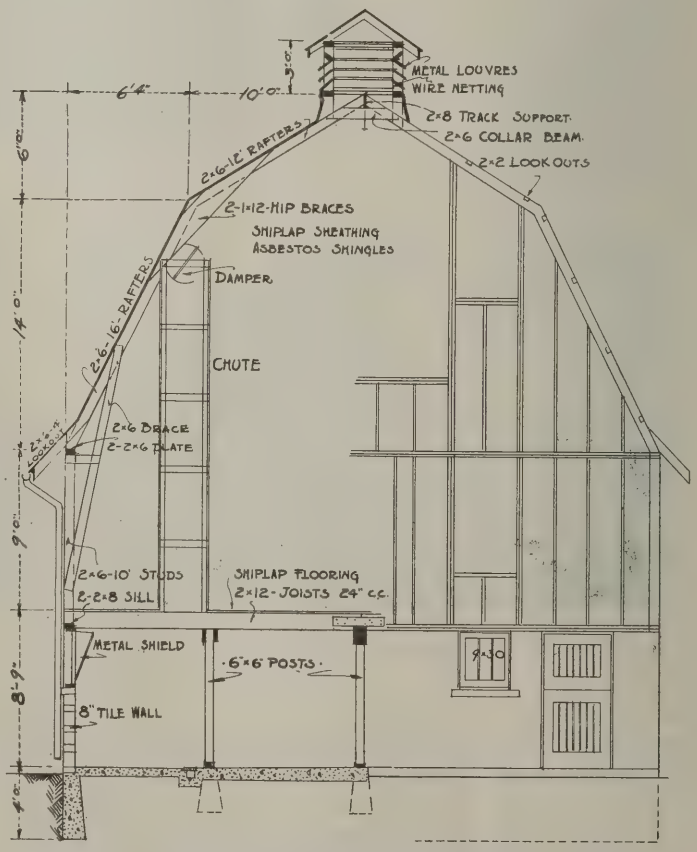
The number of new buildings now in process of construction in various parts of Providence, R. I., is said to be far in excess of the number erected in 1915, which was the banner year.



Side Elevation of Stall—Scale ¼ In. to the Foot



Floor Plan—Scale 1/16 In. to the Foot



Vertical Cross Section of Barn Showing Gable End Framing—Scale 3/32 In. to the Foot

FLOOR PLAN, CROSS SECTION AND MISCELLANEOUS CONSTRUCTIVE DETAILS

REGULATING INSTALLATION OF FURNACES

CODE ADOPTED BY NATIONAL WARM AIR HEATING AND VENTILATING ASSOCIATION

FOR several years the importance of controlling by ordinance the method of proportioning and installing furnace heating systems has been realized by those most interested in the industry. The following code, which was adopted by the National Warm Air Heating and Ventilating Association at a special meeting in Cleveland on Jan. 24, was compiled by the following committee: J. M. McHenry, chairman; A. W. Glessner, A. A. Jones and Fred Will, Jr.

The Code As Finally Adopted

ARTICLE 1.—MEANING OF THE TERM WARM-AIR HEATING PLANT

Warm-air heating plants to which this ordinance refers and is intended to cover consist of one or more furnaces or heaters inclosed in iron or brick casing which, together with necessary appurtenances thereto, consisting of warm-air pipes and fittings, cold-air pipes or boxes and fittings, smoke pipe and fittings, registers, borders, and face plates, the same being intended for heating building in which they may be installed.

ARTICLE 2.—CERTIFIED HEATING CONTRACTORS

SECTION 1. It shall be unlawful for any person, company or corporation to attempt to install or remodel warm-air heating plants in buildings within the corporate limits of the City of ———, unless such person, company or corporation shall have first applied to and received from the Building Commission of the said city a certificate or a renewal of certificate authorizing such person, company or corporation to engage in or perform the class of work which this ordinance is intended to regulate. Any person, company or corporation guilty of violating the spirit of Section 1 of Article 2 shall upon conviction be subject to a fine of not less than —— dollars, or more than —— dolars.

SECTION 2. Any responsible person, company or corporation may apply to and receive from the Building Commission of said city a certificate authorizing such person, company or corporation to engage in the business of installing or remodeling warm-air heating plants for the term of one year from date of issue, provided, however, the applicant presents to the Building Commission satisfactory evidence of ability to figure and install warm-air heating plants in accordance with the requirements of this ordinance.

For each and every original certificate issued by the Building Commission the recipient thereof shall pay into the treasury of the city the sum of —— dollars, and for annual renewals thereof the recipient shall pay the sum of —— dollars.

ARTICLE 3.—PERMITS

SECTION 1. Before proceeding with the installation of a new or remodeling an existing warm-air heating plant a certified heating contractor shall apply to and obtain from the Department of Building Inspection, a permit to proceed with such work.

It shall be unlawful for any person, company or corporation to install or remodel a warm-air heating plant without first obtaining from the Department of Building Inspection a permit therefor.

APPLICATION BLANKS—FEES

SECTION 2. Application for permits to proceed with the installation of or remodeling existing warm-air heating plants shall be made on blanks to be furnished by the Department of Building Inspection.

No permit for installing or remodeling warm-air heating plants shall be issued until the applicant shall have paid the treasury of the city fees to wit:

For each new furnace installed or old one reset, the sum of ——. For each and every warm-air register connected therewith the sum of ——. For each cold-air pipe connected therewith the sum of ——.

INSPECTION

SECTION 3. Reports on the installation or remodeling of warm-air heating plants and the inspection thereof shall be made in the following manner: viz., when the installation or remodeling shall have progressed to the point where all pipes or boxes have been placed in walls or partitions, the heating contractor shall by written notice so inform the Department of Building Inspection. Upon receipt of said notice the said Department of Building Inspection shall cause the material used and workmanship involved to be thoroughly inspected by a competent inspector. If upon inspection it is found the material used and the workmanship complies with the requirements of this ordinance and rules or regulations adopted by the Building Commission, a certificate of approval shall be attached to each pipe or box installed. If, however, it is found that the material used, or the workmanship involved, fails to comply with the requirements, the inspector shall in that event by written notice so inform the heating contractor, who shall without delay proceed to make required changes. Failure upon the part of the heating contractor to respond promptly to the said notice will be deemed an act in violation of the intent of this ordinance.

FINAL INSPECTION

SECTION 4. Immediately following the complete installation of new, or remodeling of existing warm-

air plant, the heating contractor shall by written notice so inform the department of Building Inspection, whereupon the said department shall cause the plant to be immediately inspected by a competent inspector. If it is found that the intent of this ordinance has been complied with, there shall be affixed to the furnace a certificate of approval. In the event, however, it is found that the terms of this ordinance have been violated, the inspector shall by a written notice so inform the heating contractor, which notice shall be deemed a proper demand upon the heating contractor to, without delay, proceed to make required changes. Failure upon the part of the heating contractor to act promptly will be deemed an act in violation of the intent of this ordinance.

ARTICLE 4.—CONCEALING PIPES OR REGISTER BOXES

Pipes or register boxes set in unfinished walls or partitions shall not be lathed, plastered, ceiled or otherwise concealed unless a certificate of approval shall first have been affixed to such pipe or box, by the authority of the aforesaid department of inspection.

It shall be lawful for the aforesaid department or its authorized representative to remove or cause to be removed any material that may be used to conceal pipes, fittings or boxes set in walls or partitions prior to inspection.

ARTICLE 5.—ROUND BASEMENT PIPES

SECTION 1. Round basement pipes for connections between casings of furnaces or heaters and register boxes or riser pipes having diameters of 10 in. or less shall be made of I. C. or heavier bright tin, or 27 gage United States Standard galvanized iron. Those having diameter of 12 in. or more shall be made of I. K. bright tin or galvanized iron, not lighter than 26 gage U. S. Standard.

SECTION 2. Basement pipes forming connections between furnace or heater casings and register boxes or riser pipes shall have runs horizontal of not less than 2 ft. between the casing collar and the register box or riser pipe. Round basement pipes shall be fitted with dampers, so placed as to be easily accessible for manipulation. Should warm-air pipes pass through brick, tile or cement partitions or walls, they shall be surrounded by metal thimbles having diameters of not less than 1 in. more than the diameters of the said pipes. Should warm-air pipes pass through wooden walls or partitions, they shall be provided with ventilated or safety thimbles.

All wood within 2 in. of and exposed to radiation of heat from round heater pipes shall be shielded or protected by sheets of tin or galvanized iron, with lining of asbestos sheeting.

ARTICLE 6.—SMOKE PIPES

SECTION 1. Should smoke pipes pass through wooden walls they shall be provided with ventilating or safety thimbles with inside diameter at least 2 in. greater than the diameter of the smoke pipe. The smoke pipe opening through the thimbles shall have guides or braces so arranged as to maintain an open space of 1 in. entirely surrounding the smoke pipe.

There shall be a space of not less than 6 in. between any smoke pipe and exposed wood or plastered wooden walls or other combustible material. All exposed wood or wood covered with plaster that may be within 12 inches of smoke pipes shall be shielded or protected by coverings of tin or galvanized iron lining of asbestos sheeting.

ARTICLE 7.—STACKS AND REGISTERS

SECTION 1. Warm-air conductor pipes, register boxes or fittings to be set in wooden walls or partitions, together with boots or foot pieces to be used in connection therewith, shall be double and so constructed as to maintain a continuous air space of at least five-sixteenths (5/16) of an inch between the outside and inside sections of same. The aforesaid pipes, boxes, fittings and boots shall be made of bright coke tin or other metal which for the purpose is of equal efficiency.

WALL PIPES, BOXES AND REGISTERS

SECTION 2. Stacks or riser pipes intended to conduct heated air to the second or third story shall be equal in cross section area to at least two-thirds of the cross section area of the round basement pipes intended for connection therewith, provided, however, that the aforesaid stacks or wall pipes have no offsets to exceed 4 in. between the boot and the register boxes. Should wall pipes have offsets in excess of 4 in. between the boot and the register box, they shall be equal in cross section area to four-fifths of the round basement pipes intended for connection therewith.

WALL STACKS

SECTION 3. Wall stacks in new buildings intended for connection with basement pipes having diameter of 10 in. or more shall have inside depths of not less than 5 in.

SECURING STACKS

SECTION 4. Wall stacks, wall boxes and fittings to be used therewith shall be secured in place by means of lugs or metal strips attached firmly to the outer walls of pipes, boxes or fittings, which lugs or strips shall, by nailing or otherwise, be firmly secured to the studding. It will not be permissible to drive nails or other fastening from the inside of pipes through to the studding.

WALL REGISTER BOXES

SECTION 5. First floor wall register boxes shall equal in cross section area that of the round basement pipe intended for connection therewith.

REGISTERS

SECTION 6. Warm-air registers shall have free and open area of at least ten per cent in excess of the cross section area of the round basement pipes to be used in conjunction therewith.

ARTICLE 8.—COLD AIR DUCTS

SECTION 1. By the term Cold Air Ducts, as used in this or other sections of this ordinance, is meant the pipes, boxes or ducts through which air neces-

sary for any warm-air heating plant is admitted to the furnace or heater. The cold air for warm-air heating plants may be taken from outside or from within the buildings in which such plants may be installed, or it may be taken partially from outside and partially from within; in no case, however, shall the cold air be supplied from any basement, cellar or furnace room. The cold air for any warm-air heating plant shall be conducted to the furnace or heater through galvanized iron, brick or tile pipes or boxes, the joints of which shall be dust proof or dust tight.

AREA COLD AIR DUCTS AND FACES

SECTION 2. The cold air duct as component of any warm-air heating plant for which the air is to be supplied from outside shall be equal in cross section area to at least 75 per cent of the total cross section area of all the round warm-air pipes connected with the said plant. Should the air be taken from within, or partially from within and partially from outside the building involved, the cross section of the cold-air duct or ducts shall equal the total cross section area of all the round warm-air pipes connected with the plant. The free open area of faces that may be used in conjunction with cold-air ducts shall be at least 10 per cent in excess of the cross section area of the said ducts.

ARTICLE 9.—PROVISION FOR REGISTER BOXES AND STACKS

The superintendent, architect or contractor of any building in which a warm-air heating plant is to be installed shall make ample provision in construction of walls, partitions, floors, etc., for the reception of register boxes and riser pipes which are to be set in such walls, partitions, floors, etc., of such building. Neglect or failure upon the part of the aforesaid superintendent, architect or contractor to provide for the reception of boxes and pipes shall be deemed an act in violation of these requirements of this ordinance and the parties or party responsible for said violation will upon conviction be subject to the penalty hereinafter prescribed.

ARTICLE 10.—RULES FOR ESTIMATING WARM-AIR PIPE REQUIREMENTS

SECTION 1. The rules herewith mentioned shall be observed in estimating warm-air pipe requirements. To use pipes extending from the furnace of less area than these rules require will be deemed a violation of the terms of this ordinance.

PIPE REQUIREMENTS FOR 70 DEGREES FAHR.

SECTION 2. In no case shall warm-air pipes, extending from furnace be less than 8 in. in diameter.

To find the area of warm-air pipes leading from furnaces through which heat is to be distributed to building or rooms contained therein requiring the maintenance of temperature of 70 deg. Fahr. with the outside temperature at zero, the following rules are to be used, viz.:

To the area of outside doors and windows expressed in square feet, add one-tenth of the area of outside wall surface as expressed in square feet, multiply the result thus obtained by seventy-five. To the result thus obtained, add an amount equal to the total cubical contents of the building or room as expressed in cubic feet; divide the result thus found by eighty. The result thus obtained will equal the sectional area of the warm-air pipes expressed in square inches.

PIPE REQUIREMENTS FOR 65 DEGREES

SECTION 3. The foregoing rule (Section 2, Article 10), shall be observed with the single exception that the number 100 shall be used as divisor instead of eighty.

TRUNK LINES

SECTION 4. The use of trunk line systems is permitted, provided, however, that the area of the main line shall be equal in sectional area to the combined sectional area of all branches to be supplied.

ARTICLE 11.—FURNACE CASINGS

SECTION 1. Furnaces shall be incased in brick or galvanized iron casings. The bodies of galvanized iron casings shall be lined with sheet iron or tin and an inner lining of asbestos sheeting.

LOCATION OF FURNACE

SECTION 2. Any furnace or heater to be installed as a component of a complete warm-air heating plant shall be set or erected at or near the center of the piping in the basement of the building in which it is to be installed. The architect, owner, agent or builder shall make all necessary provisions for the location of furnace or heater as hereinbefore specified.

SECTION 3. No exposed wood or wood covered with plaster shall be placed within 12 in. of the space allotted to or provided for any furnace or heater and the casing surrounding the same.

There shall be a distance of not less than 16 in. between the top of any heater and the ceiling above it and a distance of not less than 6 in. between the top of any metal casing and the ceiling above, unless, however, the ceiling is non-combustible. The tops of metal casings shall be covered with sand to the depth of not less than 1 in.

APPLICATION FOR PERMIT

The undersigned hereby makes application for permit to install.....warm-air heating plant or plants in building at .....

Owned by .....
Make of Furnace .....
Manufacturer's Number on Furnace.....
Average Diameter Firepot.....
Average Sectional Area Firepot.....
Number Warm-Air Pipes attached to each....
Combined Sectional Area Warm-Air Pipes....
Number Cold-Air Pipes.....
Area Cold-Air Pipes Inside....Outside.....
Signature .....
Business Address .....

Phone.....Certificate Number.....Date of Certificate.....Permit Number....Date...

The above permit is hereby granted this..... day of ....., 19.... The receipt of fee amounting to ..... is hereby acknowledged.

A SIX-ROOM COTTAGE FOR THE SUBURBS

EXTERIOR WALLS ARE COVERED WITH STUCCO ON METAL LATH—THE SUN PARLOR A FEATURE



WE have taken for the subject of our colored supplemental plate this month a six-room cottage well adapted for erection in the suburbs; by the seashore; in the mountains or by the lakeside. The exterior walls are stucco-coated on metal lath and the roof lines are broken by an ornate dormer, the covering being cypress or cedar shingles, according to preference. Among the noticeable features are the covered portico with its massive columns, the exposed brick chimney in the end gable and the inclosed sun parlor or porch with its four corner piers of brick.

LAYOUT OF THE ROOMS

From the front porch one enters the main hall from which rises the combination flight of stairs to the second story where are located three sleeping rooms with ample clothes closets and a bath room. At the right of the main hall is the living room extending the entire depth of the house and opening out of which through French windows is an inclosed porch or sun parlor. A feature of the living room is the open fireplace located midway between the French windows leading to the porch.

At the left of the main hall is the dining room and beyond it the pantry by means of which communication is established with the kitchen. There is a sink in the pantry and also one in the kitchen. From the kitchen leads the stairs to the cellar.

According to the specifications of the architect, the chimneys and porch columns are to be built of brick finished in clinker brick with projecting headers at irregular intervals. The general tone of the brickwork is to be dark red.

The cellar which extends under the entire building is to have foundation walls of concrete and the exposed surfaces above grade are to be stuccoed.

THE SUPERSTRUCTURE

The superstructure is to be of frame, the main plate to be 6 x 8 in. halved at the corners, and the first and second tiers of floor beams to be 2 x 8 in. doubled around all openings. The beams are to be hung in stirrup irons. The walls and partitions are to be 2 x 4 in. studs placed 16 in. on centers, the exterior walls to be covered with matched sheathing over which is to be placed building paper and then furred out with strips set 16 in. on centers to receive the metal lath for stuccoing. The stucco is to be three-coat work with a sand finish. The base course is to be formed as shown on the elevations.

The rafters are to be 2 x 6 in. placed 20 in. on centers covered with tongued and grooved sheathing boards over which is to be placed building paper and this in turn covered with first quality cypress or cedar shingles laid in regular courses with 5½ in. exposure to the weather.

The gutters are to be half round and fitted with adjustable hangers every 4 ft. The leaders are to be of 3 in. diameter and of No. 24 galvanized iron. All ridges, hips, etc., and where the chimneys break through the roof are to be flashed with extra heavy roofing tin. All tops of sash on the exterior are to be fully flashed and back-flashed in order to secure tight sash.

The entire interior trim is to be of chestnut or cypress and to have plain fascias and soffits all in accordance with the details shown on page 148.

The flooring of the rooms of the main story are to be doubled, the finish floor to be of comb-grained tongued and grooved maple, blind nailed. The rooms of the second story are to have single thickness tongued and grooved flooring.

VARIOUS DETAILS

The main roof and dormer rafters are to be exposed where projecting in the cornice and are to be dressed. The porch is to have built up hollow wooden columns 12 in. in diameter with plain cap and base as shown in the details.

All sash is to be double-hung except the dormer sash which is to be hinged so as to open inward.

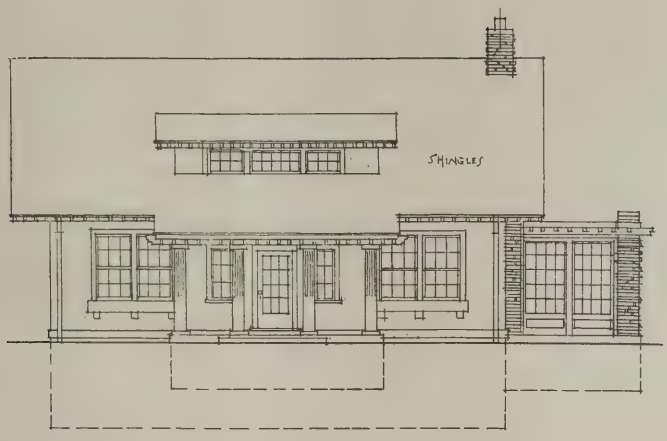
The walls of the various rooms are to be plastered with three-coat work on spruce lath. The cellar walls are to be whitewashed.

The bath room is to have a floor of white tile laid upon a concrete bed. The tile is to have cove and base and is to continue upward in the form of a wainscoting for a distance of 4 ft. above the floor terminating in a sanitary cap.

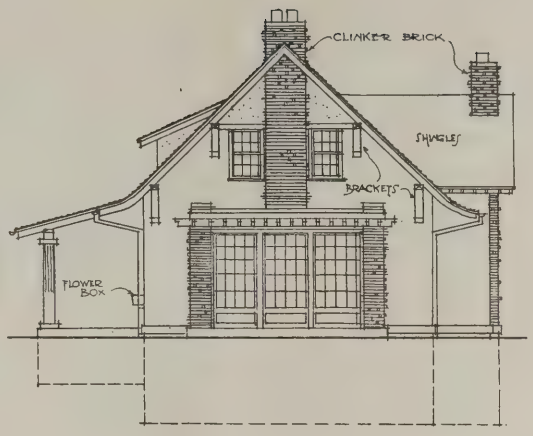
The heating is to be through the medium of a hot water system with hot water boiler of sufficient capacity to guarantee 80 deg. throughout the house when the thermometer registers zero outside. All rooms except the kitchen are to be provided with radiators of sufficint capacity to maintain the temperature above stated.

The house is to be wired for electric lights and piped for gas supply. The living room is to have a drop pendant for five electric lights and all other fixtures are to be of the combination pattern. The dining room fixtures are to be drop pendant and all other outlets are to be wall outlets.

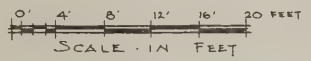
All exterior trim and woodwork are to receive

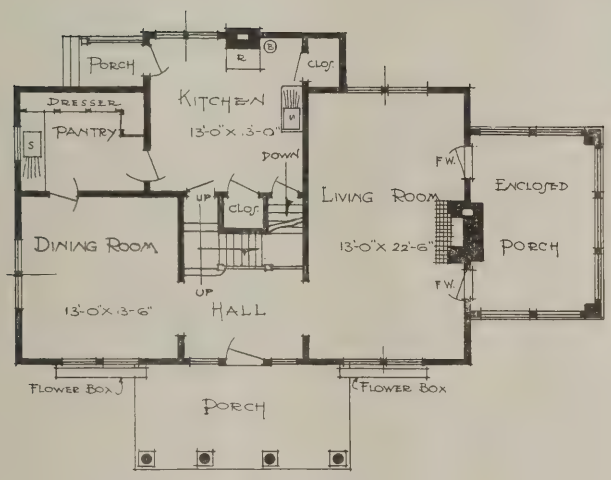


FRONT ELEVATION

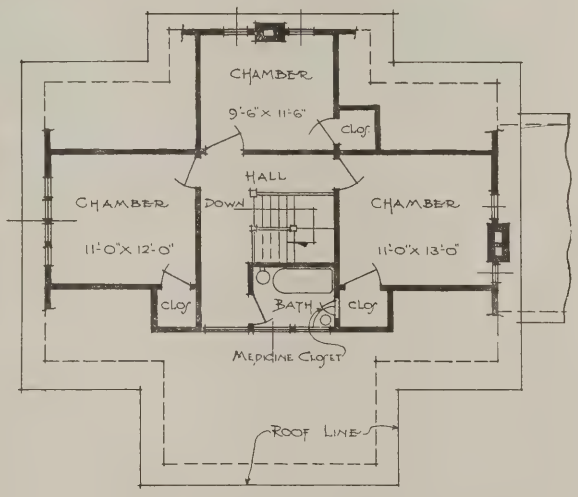


SIDE ELEVATION

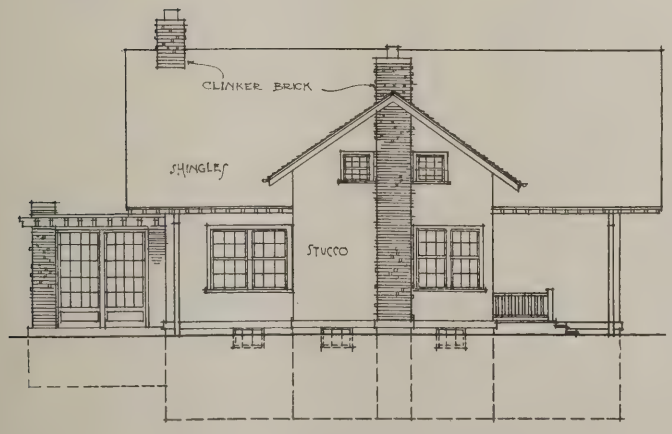




FIRST FLOOR PLAN



SECOND FLOOR PLAN

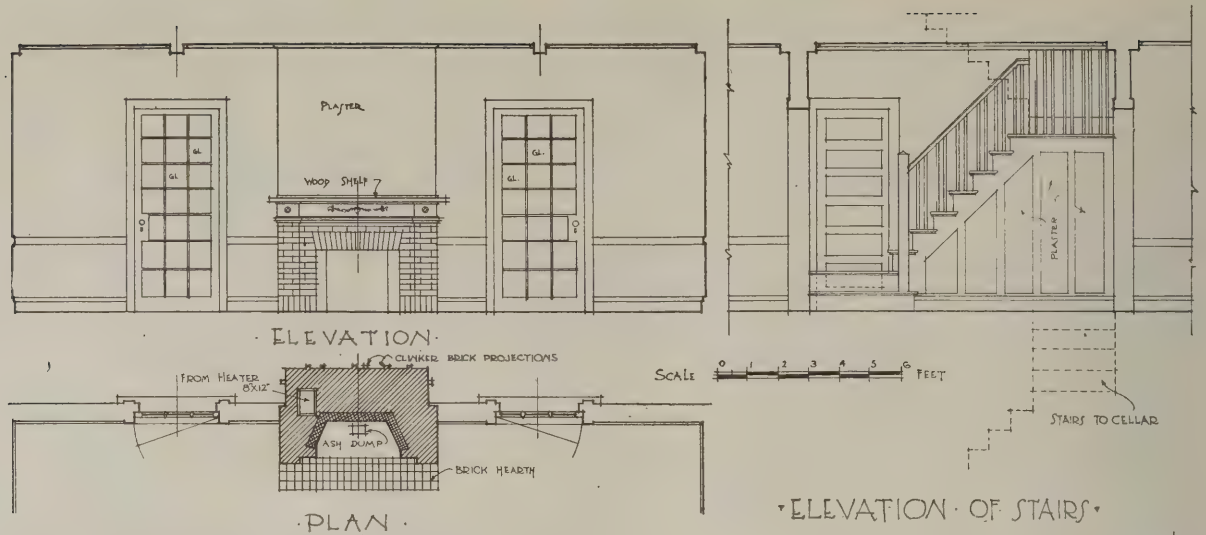


REAR ELEVATION

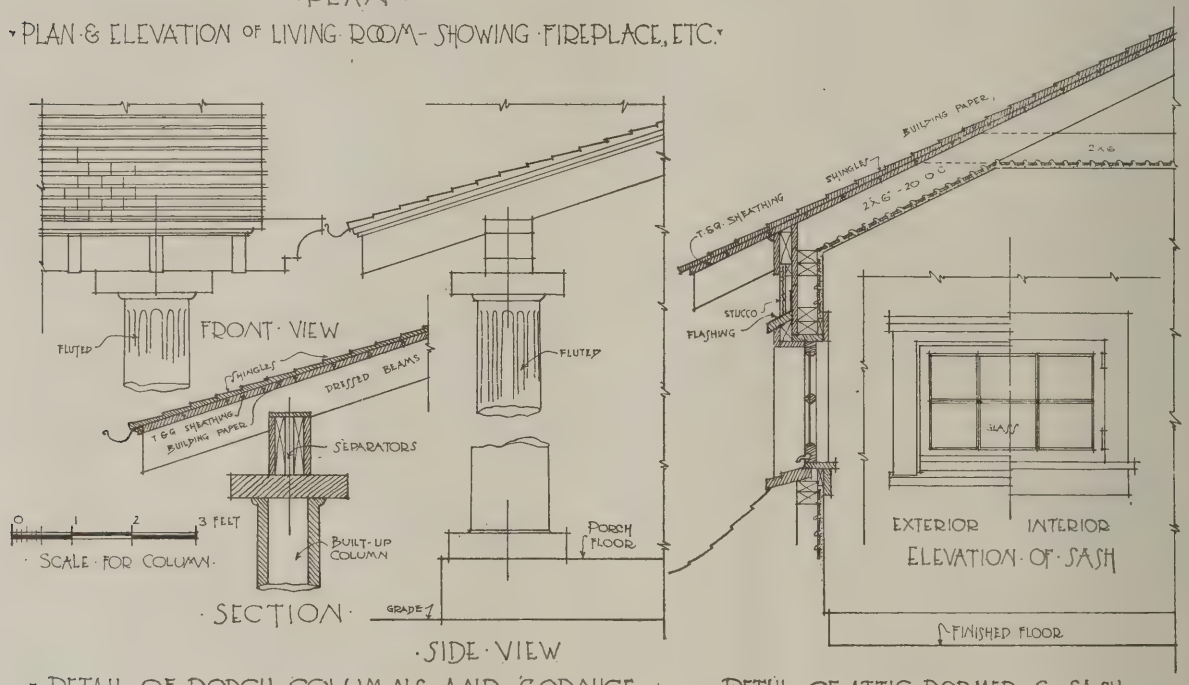


SIDE ELEVATION

PLANS AND ELEVATIONS OF COTTAGE SHOWN ON THE COLORED SUPPLEMENTAL PLATE

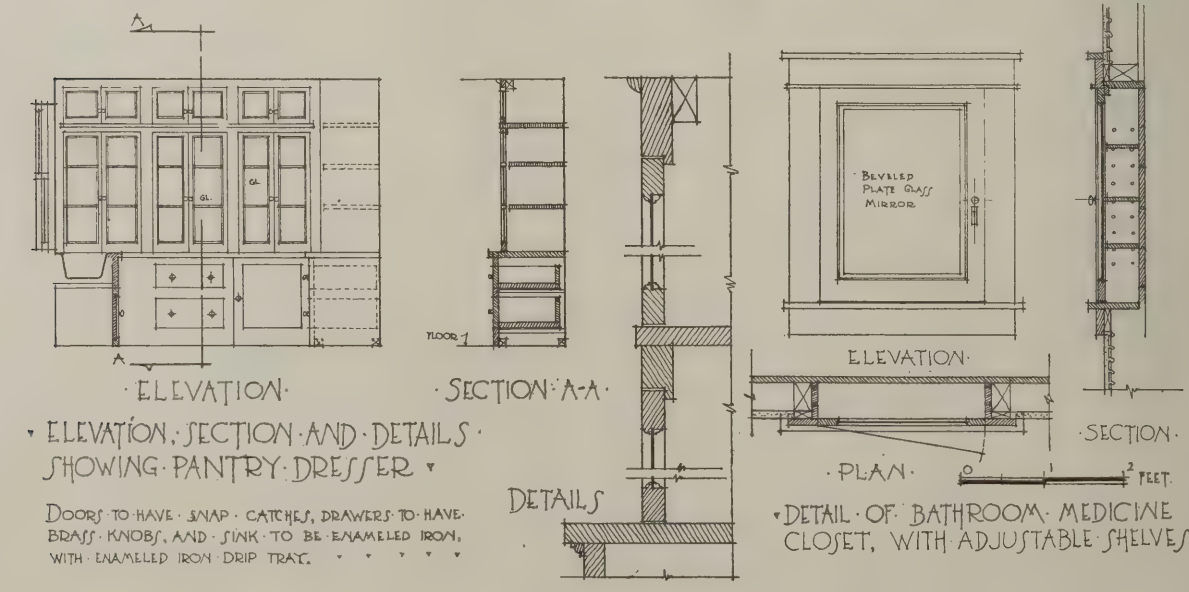


PLAN & ELEVATION OF LIVING ROOM - SHOWING FIREPLACE, ETC.



DETAIL OF PORCH COLUMNS AND CORNICE

DETAIL OF ATTIC DORMER & SASH



ELEVATION, SECTION AND DETAILS SHOWING PANTRY DRESSER

DOORS TO HAVE SNAP CATCHES, DRAWERS TO HAVE BRASS KNOBS, AND SINK TO BE ENAMELED IRON, WITH ENAMELED IRON DRIP TRAY.

DETAIL OF BATHROOM MEDICINE CLOSET, WITH ADJUSTABLE SHELVES

MISCELLANEOUS DETAILS OF COTTAGE SHOWN ON THE COLORED SUPPLEMENTAL PLATE

three coats of linseed oil paint, cream white in color. The roof shingles are to receive two coats of Indian red shingle stain well worked into the joints.

The interior trim throughout the house is to be grained and varnished or stained as required.

The architect computes the cubical content of the cottage here shown as 26,702 cu. ft. on which he places a unit price of 19c per cu. ft. Among the more important items in his estimate are excavating and grading, $150, concrete walls, piers, brick chimneys, etc., $650, plastering work, $320, carpentry and mill work, $1,869, plumbing, $430, heating, $480, metal work, leaders, gutters, etc., $210, tile work, $60, painting, $320, gas and electric installation, $380, hardware, constructive and ornamental, $110. This estimate the architect points out is not guaranteed for any special locality owing to varying conditions of labor, finish and materials, nor does it include the contractor's profit.

The cottage was designed by Frank T. Felner, 413 Caton Avenue, Brooklyn, New York, or care of THE BUILDING AGE, 50 Union Square, New York City.

STRAIGHTENING WALLS OUT OF PLUMB

A PRACTICAL EXAMPLE SHOWING APPLICATION OF THE TURNBUCKLE AND SPANISH WINDLASS

By Owen B. Maginnis

AMONG the many problems which are liable to come within the scope of the progressive carpenter-contractor and builder there is perhaps none which calls for more care, ingenuity and thought than that of the failure of walls by spreading, bulging or buckling. It might be said that these faults rarely occur, but they *do* sometimes, and any information relative to the cause and treatment may perhaps prove valuable to those interested in this class of work.

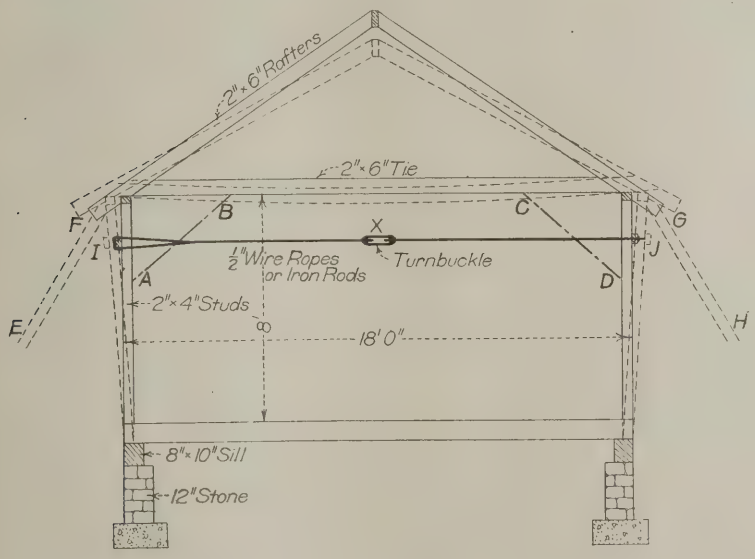


Fig. 1—Cross Section of House, the Walls of Which Have "Spread" and the Roof Has Sagged as Shown by Dotted Lines

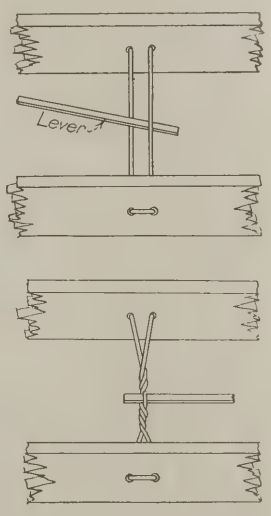


Fig. 2—Showing What Is Known as the Spanish Windlass and Its Application

In balloon frames or wooden walls these developments manifest themselves in many ways which are more or less dangerous, the most common being that indicated in Fig. 1, where by reason of the omission of the necessary angle braces and collar ties which would be placed as shown by the dotted lines *A-B* and *C-D*, the opposite walls have been thrust outward until they are out of perpendicular or plumb to the extent of about 4 in. In a very long, low building, say, 100 ft. or over and having a 2 x 4 in. stud wall 8 ft. high, this will become a serious menace to its safety.

A very feasible and handy way to counteract this tendency of "spreading" would be to set pushing braces or shores on the outside faces of both walls, as, for example, *E-F* and *G-H*, reaching from the wall plates to the ground, into which stakes or blocks have been set; then wedging the walls back to their proper plumb position. Should the adjoining space, however, not be available for this method of treatment, then the use of the "turnbuckle" or the "Spanish windlass" will be imperative.

Concerning the former, which is illustrated in Fig. 4, it will be seen that it is formed by wrought iron or steel bar loop about 12 in. or 15 in. long and 3½ in. wide. It is made of ½-in. or ¾-in. round bar iron or steel forged to full strength, bored, tapped and screwed at each end to receive the ends of two right and left-hand threaded rods, which are fitted for greater power with nuts, all as clearly

indicated in Fig. 4, which is an enlarged view of the turnbuckle shown in Fig. 1. By turning this loop or turnbuckle with a 3-ft. lever bar the opposite rods are drawn towards each other and the outside ends must naturally follow.

By reference to Fig. 1 it will be noticed that the 2 x 6-in. temporary cross stringers placed across the outside faces of the shiplap siding are bored with ⅞-in. holes and are bolted on the rods of the turnbuckles, of which there should be two or more sets spaced about 8 ft. or 10 ft. apart. They can be moved along, covering 10 ft. or 12 ft. sections of the house as it is straightened up, and firmly braced in the manner indicated in Fig. 3 of the sketches. Here the section illustrates the manner in which the building should have been properly constructed originally, with the angle wall braces and the trussing members of the roof.

In the haste of building shacks, tool houses, bunk houses, camp buildings and the like the proper

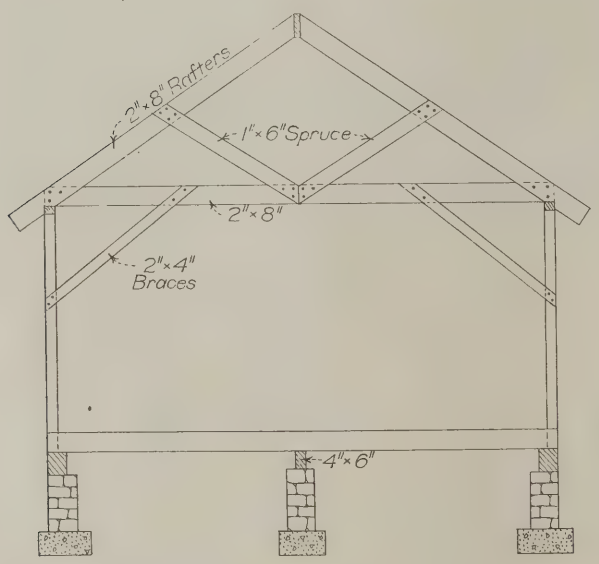


Fig. 3—Cross Section of Building Shown in Fig. 1 After Its Walls Have Been Made Plumb

bracing is too often either neglected or forgotten. The result is that they settle, warp and frequently are strained and pushed out of plumb or possibly they are blown over by the violent winds which frequently accompany the storms of summer and winter. This happens when they are of great length, say, over 100 ft., so that they expose a large area of wall surface to the pressure of the wind.

Again, as shown in this example, the roof sags under the weight of the snow and ice of winter because provision has not been made for or against it. Therefore, this class of frame building should be well braced, trussed, and of a rigid character in order to resist any contingent exposure or task which they may have to endure. It is a mistake to build carelessly at any time and criminal to put the lives of human beings in danger.

The somewhat cheaper and simpler method of doing the work under consideration is by means of a twisted rope or thin chain doubled as represented in Fig. 2. This simple appliance can be quickly improvised with a length of good soft pliable rope up to 1½ in. in diameter. The thinner ropes are most adaptable, but the thickness required will depend entirely upon the work to be done and the strain or weight that the ropes must sustain added to the judgment of the building contractor or foreman.

For the information and guidance, therefore, of those who have much to do with ropes, the accompanying tables will be found of value, showing, as they do, the capacity and endurance of ropes of varying size and weight. The first one shows weights hemp rope will bear with safety:

Strength of Rope of Varying Sizes

Circumference	Pounds	Circumference	Pounds
1 in.	200	3 in.	1,800
1¼ "	312.5	3¼ "	2,112.5
1½ "	450	3½ "	2,450
1¾ "	612.5	3¾ "	2,812.5
2 "	890	4 "	3,200
2¼ "	1,012.5	5 "	5,000
2½ "	1,250	6 "	7,200
2¾ "	1,512.5		

It should be noted that a square inch of hemp fibres will support a weight of 9,200 pounds. The *maximum* strength of a good hemp rope is 6,400 pounds to the square inch; its *practical* value not more than one-half this strain. Before breaking it stretches from one-fifth to one-seventh, and its diameter diminishes one-fourth to one-seventh. The

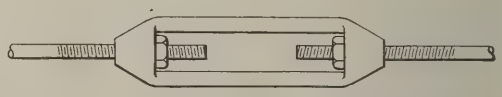


Fig. 4—Enlarged View of the Turnbuckle Shown in Fig. 1

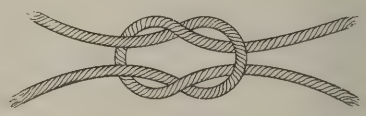


Fig. 5—Knot to Be Tied in the Rope Shown in Fig. 2

strength of manila is about one-half that of hemp. White ropes are one-third more durable.

All manila rope should be made from pure manila hemp and of best quality. The following table shows size of rope to support varying weights:

Sizes of Manila Rope to Support Different Weights

Size in diameter, inch	¼	5/16	⅜	½	⅝	¾	⅞	1
Weight of 100 ft., pounds	3	4	5½	8	15	17	25	33
Strength of new rope, pounds	450	750	900	1,700	3,000	4,000	5,800	7,000
Price, in full coils of 1000 ft., ⅜ in. and smaller	Per pound, $....							
Larger than ⅜ in.	" "							
Price, cut, ⅜ in. and smaller	" "							
Larger than ⅜ in.	" "							

After the selection of the proper size of rope it can be passed through the building and inserted in the hole bored in the outside stringers in the manner indicated in the sketch in the upper part of Fig. 2. The holes may be from 4 in. to 6 in. apart and the rope drawn tight and parallel. Care must be exercised in making the knot joining the ends, which

may be an "8" properly made, as in Fig. 5, and not a "gramy," which will slip. It is simple to make, and the ends must be so placed as to give two full and complete self-tightening nooses.

When all is ready the lever bar, which may be of 2-in. oak, is turned either to the right or left, thus twisting the rope, as seen at the bottom sketch of Fig. 2, and by this tightening process the walls are built toward each other. When they are plumb or the work is in exact position, the twisting bar may be securely tied to maintain the strain. This must be thoroughly done and the fastenings made positive, for if they are liable to become loose the twisted rope will spin the bar around like lightning and it is certain to do damage if not hurt somebody.

From the above comments practical readers of the paper will recognize the utility and value of these two simple appliances, which by ingenuity and good judgment may be used to advantage and should always form part of every building contractor's plant so as to be readily at hand, as he never can tell when they may be wanted.

CHICAGO'S TENTH ANNUAL CEMENT SHOW

AN EXHIBITION OF UNUSUAL INTEREST AND VALUE TO MEMBERS OF THE BUILDING TRADES

THE tenth Annual Cement Show opened auspiciously on Wednesday, Feb. 7, in the Coliseum, Chicago, Ill. Every foot of space on the main floor and balcony of the building, as well as of the annex, was sold, and many manufacturers who had delayed making reservations were disappointed in being unable to obtain space. At one time the management considered the feasibility of renting the Greer building next door in order to accommodate the over-flow, but finally decided, however, not to do this.



INTERIOR VIEW OF CHICAGO COLISEUM DURING PROGRESS OF THE CEMENT SHOW

As usual the exhibits were principally of concrete machinery, including mixers, both large and small, steel "forms" for both light and heavy construction work, fence post molds, reinforcing material, waterproofing and accessories of various kinds used in connection with concrete work.

The Cement Show has gradually undergone an evolution. In 1907, when it was held in Tattersall's Armory, the exhibits were principally of concrete block machines. At the present show we find motor trucks, asphalt shingles, sculptured concrete and the highest type of concrete mixing and conveying machinery. In fact, the show is actually a reflection of the progress of the industry.

Ten years ago the concrete business was largely

in the hands of specialists. Now, such has been the increase in the use of cement, that contractors large and small throughout the country are using it successfully.

Only a few years back one found more of the continuous type of mixers than batch mixers. This year there were not more than two makes of continuous mixers exhibited. This is largely due to the fact that engineers are said to disapprove of the continuous mixer. With the disappearance of the continuous type the small batch mixer sprang into popularity, and even on large jobs contractors are using several small machines in preference to one large machine.

While the foregoing remarks are largely historical it is impossible for one who has attended practically every Cement Show not to notice these changes. It is proper to mention them, too, because they represent the changes that have taken place in this industry.

Five conventions were held during the show. The National Builders' Supply Association held meetings at the Sherman House, Feb. 12 and 13. The Illinois Lumber and Builders Supply Dealers Association were at the same hotel on the 14th, 15th and 16th. The American Concrete Pipe Association met at the Auditorium Hotel on the 12th, 13th and 14th, and the American Concrete Institute and the Association of Engineers met at the Hotel LaSalle on the 8th, 9th and 10th. These meetings attracted a great number of men who took the opportunity to visit the Cement Show.

In the decoration of the Coliseum the American flag predominated. On the east side facing the entrance one first beheld an American flag, said to be the largest in the world, and is owned by Marshall Field & Co. This flag can be seen in the photographic view presented on the first page of this article and which shows the general view of some of the more important exhibits at the show.

The Annex was occupied by members of the National Association of Mixer Manufacturers. None of the mixers in this group were operated. In the center of the exhibit a large space was set aside for the accommodation of guests. The rugs, palms and wicker furniture presented a restful atmosphere to one who had just left the busy, noisy Coliseum.

The architectural exhibit and the display of sculptured concrete by Mrs. George Fabyan and associates of Geneva, Ill., deserve special mention. We may be able in a later issue to picture some of this work.

While we are unable to give any figures of attendance, Manager Meade stated that the number of visitors was larger this year than last and there were a greater number of contractors than usual. Some of the exhibitors reported a very gratifying number of sales, and unquestionably more sales will be made as a result of the show. Contractors realize that in this exhibition they have an exceptional opportunity to see and compare the various makes of machines offered them.

CONVENTION OF NORTH CAROLINA BUILDERS' EXCHANGE

The eighth and largest annual convention of the Builders' Exchange of North Carolina was held in Raleigh, January 23-24. The address of welcome made by James I. Johnson, mayor of Raleigh, was responded to by Phillip Williams, attorney for the Exchange. The reports of the officers showed the Exchange to be steadily growing in prosperity, and during the convention a number of new members were gained. Interesting addresses were made, and the convention adopted a resolution urging the enactment of the proposed "Workman's Compensation Act," which is now under consideration by the General Assembly of North Carolina. Officers for the ensuing year were elected as follows:

President.....J. N. Longest of Greensboro
1st Vice-pres.....J. R. McClamroch of Greensboro
2nd Vice-pres.....C. V. York of Raleigh
Treasurer.....L. G. Berry of Charlotte
Traffic manager.....J. R. Burch of Greensboro
Secy. and atty...Phillip Williams of Winston-Salem

The closing feature of the convention was an elaborate banquet at the Hotel Yarborough, and among the speakers were Lieut.-Gov. O. Max Gardner, and J. S. Manning, attorney-general of North Carolina. Coincident with the convention were meetings of the General Contractors' Association, Subcontractors' Association, and Materialmen's Association, all of which were largely attended.

MILWAUKEE HOME EXHIBITION

The first annual Milwaukee Home and Real Estate Show will be held in Milwaukee, Wis., April 9 to 15 inclusive, and it is intended to be a complete exhibition of home, office and factory construction as well as of designing and outfitting. Building materials, architectural plans, builders' hardware, etc., are to be included.

VALUE OF MANUAL TRAINING WORK

Another testimonial as to the value of manual training work in public schools is contained in the recent erection of a two-story building by students in Las Vegas, N. M. The building, which is to house a department of the Normal School, is 40 x 80 ft., contains requisites for manual training work, electrical conveniences, etc., and was erected from plans drawn by the students, the construction work being done under the supervision of a teacher.

A JOB OF FINE FLOORING

In a house in Eastern New England a concern doing fine floor work recently installed in the living room a teakwood plank floor, in the library a teakwood block flooring, in the dining and reception rooms oak flooring in parquetry, in the hall and breakfast rooms teakwood laid in herringbone fashion, and in the sleeping rooms oak plank flooring, strip-flooring and in teak blocks.

CORRESPONDENCE

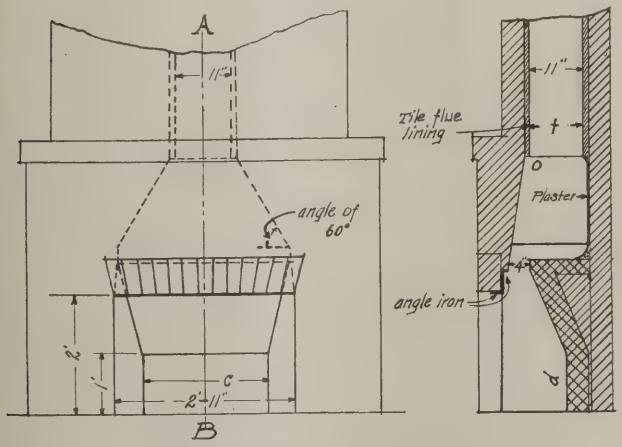
A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

SMOKE CHAMBER IN A FIREPLACE

From W. H. Hefelfinger, St. Louis, Mo.—In answer to the inquiry of E. B. A. of Mount Vernon, N. Y., regarding the construction of a fireplace, I submit the following:

In regard to the smoke chamber's relation to the rest of the fireplace, while there is no stated proportion there is still a certain relation between it and the area of the opening and the flue. The length of the throat is always about the full width of the fireplace opening, and the distance from throat to back of smoke shelf depends upon the size of the opening. Now, from the smoke shelf the sides of the smoke chamber should be perpendicular for at least one course of brick, then drawn over at an angle of 60 deg., as shown on drawing. This angle should always be the same, regardless of the size of flue or opening. Sometimes it may be necessary to change this a little owing to the construction of the mantel.

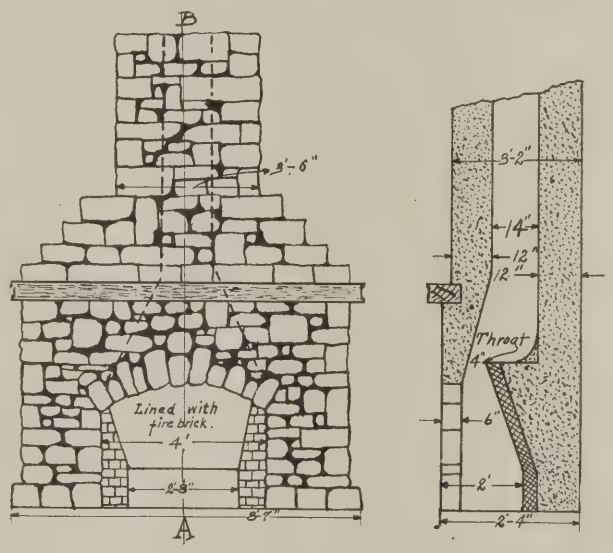
The front part of the smoke chamber is drawn over till the flue is the right size at the point "o," as shown by the drawing, unless the face construction causes it to come in a little quicker. The area of the flue should be at least 1/10 of the area of the opening of the fireplace, but when I say area of the flue I mean the size of the opening at "f." Some flues have flue lining, others do



OUTLINE ELEVATION AND VERTICAL SECTION OF FIREPLACE

not, and this must be considered. Flue lining generally reduces a flue about 2 in. on a side, which means considerable in the area. Flue lining reduces a 9 x 9-in. brick flue to a 7 x 7-in. area, a 9 x 13-in. to a 7 x 11-in., and a 13 x 13-in. to a 11 x 11-in.; hence one should be sure the flue is large enough.

The throat should be centrally located over the fireplace opening, and the flue should be over the



A COBBLE STONE FIREPLACE

center of the throat, as shown by drawing, and then drawn to either side if necessary to have it there. The distance "C" or back of fireplace should, for best heating purposes, be about one-third of the width of the opening, but this makes the opening rather small unless it is a large fireplace. In the sketch shown "C" is two-thirds of the width of opening, which gives a good opening and also gives some flare to the sides, which is necessary to reflect the heat into the room.

The height "D" is generally about 1 ft. This fireplace is intended to be built in a frame house, with the brickwork on the outside. In fireplaces that are built in brick houses the rough work is built first and the face built after the house is under roof is of somewhat different construction.

PAINTING A CEMENT FLOOR

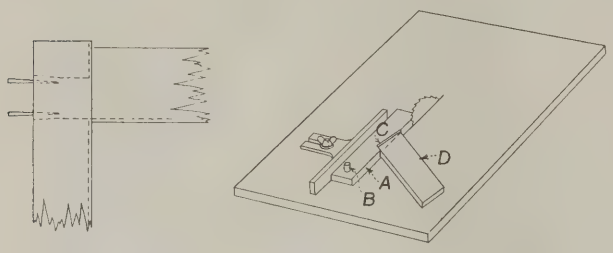
From L. G., Pittsburgh, Pa.—I would like very much to know through the Correspondence Department just how to treat or paint a cement floor in an automobile show room so that it will hold the paint and retain a nice appearance. The writer is interested in a local sales agency handling automobiles and finds that the cement floor,

having been put down a number of years ago and possibly somewhat impregnated with oil, will not hold paint, and although it has been painted a number of times during the past year the floor is in a terrible condition within a few weeks after the paint has been applied.

We were thinking about having this cement floor recoated with some cement surfacing, tile or preparation that would make a clean, permanent flooring. Any suggestions which the concrete experts may offer will be greatly appreciated.

WEDGING A HAUNCHED TENON

From James F. Hobart, Indianapolis, Ind.—Referring to the haunched tenon presented by "W. H. C.," Peoria, Ill., the writer has seen in use a



WEDGING A HAUNCHED TENON

combination of the two methods presented by him. The combination method, shown in Fig. 1, has the merit of holding the tenon fast, beyond all possibility of its ever slipping loose, particularly when the wedges are dipped in glue before being driven home.

The mortise is dovetail tapered and the wedges are let into the tenon a short distance from its edges. The point is that after the wedges have been driven, the tenon is virtually a dovetail and cannot be pulled out until something breaks. If the wedge be driven too far from the edge of the tenon, great strain is put upon a wide section of the tenon, which is thereby weakened by the bending or crippling of all the fibers between the wedges and the edges of the tenon.

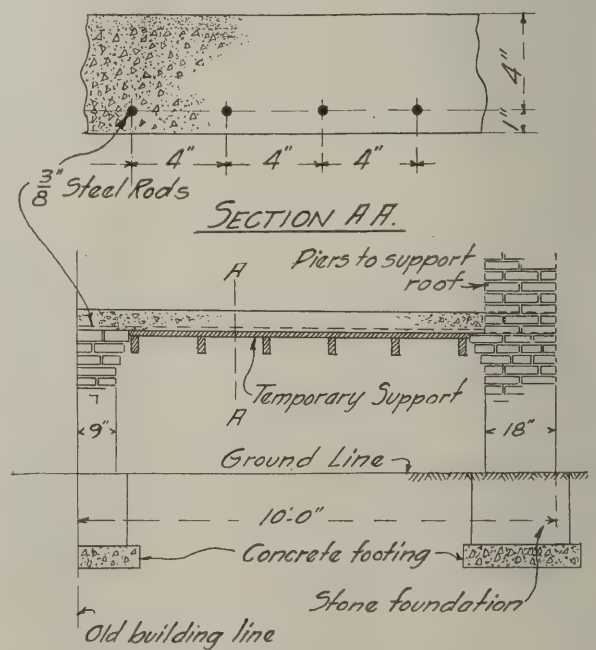
In some kinds of soft woods the crippling of the tenon fibers is not noticeable when the tenon is made of sap-wood, but when it is hard and brash, and composed of heart-wood, there is great danger of the tenon being broken outside of the wedges. In all cases the wedges should be made very slim, with a very long taper in order that the bend in the tenon may not be abrupt.

When many tenons are to be put together in this manner a large number of wedges will be required, and it is quite a task to saw them out. Fig. 2 shows a simple jig by means of which wedges may be quickly made upon any saw bench. The jig A is merely a bit of plank, preferably hardwood, with a stout pin *B* inserted and glued. This pin is for pushing and pulling jig *A* back and forth past the circular saw. A notch *C* is cut in the jig, the notch being made just the width and length of the required wedges. The prepared wedge stock *D* having been dressed to thickness and squared up, with the grain running the short way of the stock, is placed in the notch *C*, as shown, held there and the jig pushed past the circular saw. The jig is then pulled back after a bit of work with the plank *D*, whereby the wedge is slid out of the notch and is left on the saw table beyond the saw. A little practice will be necessary to get the knack of dumping the wedge, then the work is easy.

BUILDING A CONCRETE PORCH

From R. G. Brown, Columbus, Ohio.—In reply to the query of "F. W.," Savannah, Ga., in the February issue of the paper, I am sending sketches showing a cross section of a concrete slab porch floor suitable for the requirements which the correspondent specifies. The concrete in this slab should be made of a mixture consisting of one part Portland cement, two parts clean sand and four parts of crushed stone, by volume. The finishing layer should be made of one part Portland cement and two parts clean fine sand by volume and should be about 1 in. thick, sloping outward from the main building for drainage. It should be graded to a true plane surface with a wooden float and finished with a steel trowel. The reinforcing bars should be placed as shown in the sketch. These can be plain or twisted ⅜ in. round steel rods placed 4 in. center to center. The 40-ft. porch will require 120 bars 19 ft. long.

The temporary support can be made of ⅞-in. boards supported on 2 x 4 in. joists blocked up from the ground and should not be removed until the slab



BUILDING A CONCRETE PORCH

is thoroughly set—about one month. Occasionally the support is never removed owing to the difficulty of getting at it.

This floor slab is designed to support 100 lb. per square foot in addition to its own weight.

BEVELS IN ROOF FRAMING

From C. F. S., Brooklyn, N. Y.—In a recent issue of THE BUILDING AGE there was explained in an interesting way just why the length and the run of the common rafter, when taken on the steel square, give the bevel which fits the jack along the hip. The rule is understood to apply only where the plain line of the hip and the plate make an angle of 45 deg.

Under just this same condition of hip and plate there is another rule for finding by means of the steel square the bevel for backing the hip. It seems just as simple and no less invariably correct. It consists in taking the length of the hip on the blade and marking along the tongue on which the rise of the hip is taken.

I should be glad, as I have no doubt other readers of the paper would be also, if some of our able writers on the subject of roofing would be kind enough to make the reason of this latter rule as plain and understandable as they have made that of the former one.

BUILDING METHODS IN KANSAS

From J. P. W., Lane, Kan.—I have read what "R. W. W.," Dayton, N. Y., has had to say about me and the slur he gives Kansas. I can truthfully say that I never made or saw an outside door sill constructed of cottonwood—or an inside one either. We do not make sills for inside door frames here. Mr. Barry says they do erect some good buildings in this state, and we are building better every year. I have used some good old common honest oak, as "R. W. W." calls it, in building work. In 1881 I built an eight-room house for my father, using 2 x 4-in. studs 16 in. on centers, and all the outside studs were cut of one burr oak log which grew on his own land. The outside doors, window casings and jambs were walnut.

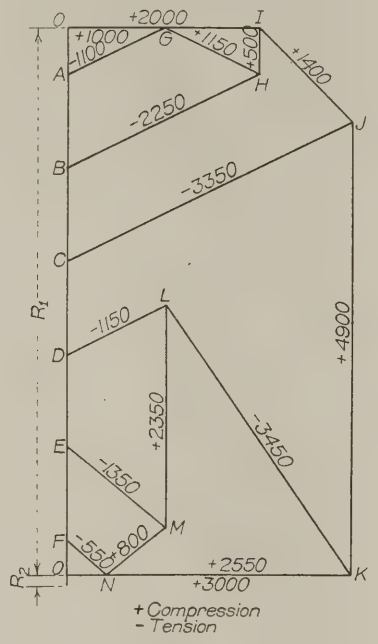
For the last ten years I have not done much outside work, as I have had about all I could do in my shop. I would like "R. W. W." to give me some points on making frames. I have made thousands of doors and window frames, but I never heard before of putting a strip of iron on the rabbet of the threshold of a door frame. In fact, I never heard of a threshold being rabbetted, but have seen and used strips of iron on top of the threshold. I rabbet all my door jambs, using 2 in. thick stock. I ship in my lumber by the carload and obtain my finish in the rough, full size. Old fir sawn from butt logs of old red fir trees 4-in. to 12-in. diameter, and there is no better lumber grows in the world for building purposes.

Our buildings here are generally constructed of yellow pine, fir or cypress. I refer, of course, to frame buildings. White pine is not carried in stock here by any retail yards so far as I know, but it used to be the principal lumber used in this section. We extend an inviation to "R. W. W." to stop here in Lane the next time he comes to Kansas, see our shop, and inspect the lumber we use, and then tell us if it is not as good as he uses in New York.

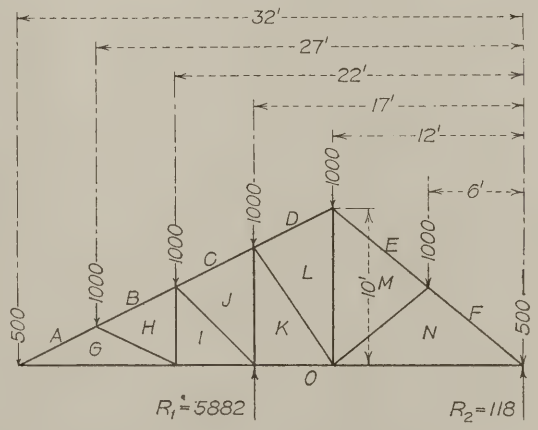
STRESS DIAGRAM FOR CANTILEVER TRUSS

From Builder, Chicago, Ill.—Will some reader of THE BUILDING AGE, more especially Mr. McCullough, tell me how the stress diagram should be drawn for the cantilever truss shown in the accompanying sketch? The weights on the panel points, as well as the distances, are given. I have tried to work it out, but I obtain such an odd shape that I am afraid I have made a blunder.

Answer.—In answering the above request, Mr. McCullough says: In a cantilever truss, the two



THE STRESS DIAGRAM



ELEVATION OF THE TRUSS

loads on the extreme ends of the truss are taken into account. In trusses supported at the two ends the extreme end loads do not affect the truss, so are neglected. In the truss here considered the reactions are first found as follows:

$$R_1 = \frac{(32 \times 500) + (27 + 22 + 17 + 12 + 6)\,1000}{17} =$$

5882 lb.

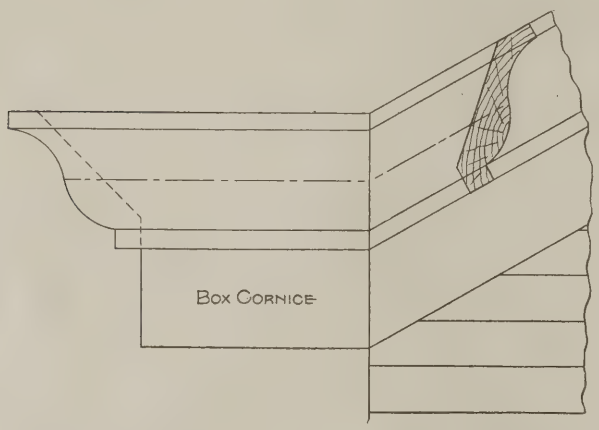
$$R_2 = 6000 - 5882 = 118 \text{ lb.}$$

The above reactions are obtained on the supposition that the load on the extreme right is carried to the truss by the purlins. If it is carried directly to the walls by the roof boards the truss would need to be anchored down for 382 lb.

Set off the loads to scale on a vertical line, and mark the divisions as in the stress diagram. The stress diagram is then completed as shown.

MITERING RAKE AND LEVEL MOLDINGS

From W. S. Wilkin, Hillsboro, Ohio.—I was much interested in reading the article by G. L. McMurphy on "Mitering Rake and Level Moldings," but it seems to me that he has made a slight mistake in showing how to develop a raking mold to miter with a level mold. He says to member with a "level mold," but I think he means to miter with a level mold. Of course, it would have to member in either case. If he means to member against the end of the molding, as shown in Fig. 1, which represents a box cornice and the level mold returns around the corner and the rake mold butts against the end of this return, his method is correct. I do not, however, think he means this, for it would not be necessary to get out an extra mold for that. It could be done as indicated in Fig. 2—just make a miter joint at *A*, Fig. 2, and he can use the same mold all around. I do not wish to criticize Mr. McMurphy, for he probably has simply overlooked this mistake (we all make mistakes), but it might mislead some one who does not thoroughly understand the matter, so I will show how to develop the rake mold.



Mitering Rake and Level Moldings—Fig. 1—Box Cornice with Level Molding Returning Around the Corner and Buting Against the Rake Molding

In Fig. 3 the line *a-b* is the slope of the roof; *B* is the level mold and we must develop the mold *C* to miter with this mold at the corner of the building. In order to do this divide the mold *B* into any number of equal spaces as *c-d-e-f-g-h-i*. From these points and from *j* also, draw lines parallel to the slope of the roof. Next draw perpendicular lines from *c-d-e-f-g-h-i* and number them as shown. Now draw perpendiculars to the line *a-b* as shown at *C* making 1′-2′ equal to 1-2 and 2′-3′ equal 2-3, etc. Now *c′-d′-e′-f′-g′-h′* and *i′* are points through which to trace the curve. It should also be stated that *j′-k′* is equal to *j-k*.

Now suppose we are using this molding on a building that has a roof sloping only one way, as indicated in Fig. 3, and at the lower side of the roof forms an acute angle with the side of the building. If we use the mold *B* here and the mold *C* at the end we must then develop a mold to miter on to *C* to use on the upper side of the building where the roof forms an obtuse angle with the side of the structure.

To do this, draw the line 1″-8″ the same length as 1-8 and make the spaces 1-″-2″ equal to 1-2 and 2″-3″ equal to 2-3, etc. Drop perpendiculars from these points and *c″-d″-e″-f″-g″-h″* and *i″* will give the points for the curve and *j″-k″* will equal *j-k*.

If we make the molding *C* and *D*, as shown, making the angle at *k′* and *K″* a right angle, as most moldings usually are, the molding *C* will not cover the part marked *x* on the mold *B*, and the mold *D* will not cover the part marked *x* on the mold *C* but if we add the part marked *o* to the mold *C* it will cover *x* on mold *B;* but then we must add the part marked *o* to mold *D* in order to cover *o* on the mold *C*.

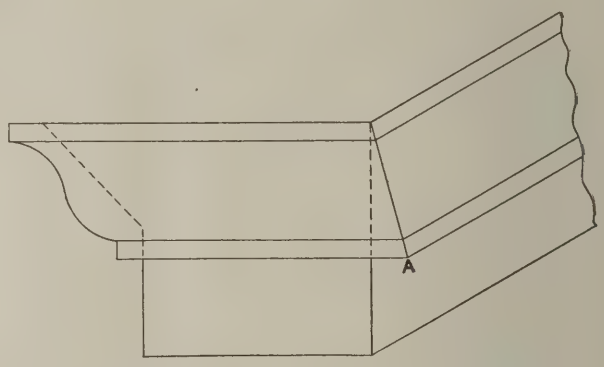


Fig. 2—Showing How the Problem Could Be Solved if Desired

The method of Mr. McMurphy for laying off a miter box for cutting a rake mold is in thorough accord with my own ideas—taking the run and the rise will give the cut on the side of the box; take the length per foot run on the blade and 12 in. on the tongue and the blade will give the cut across the top of the box.

In Fig. 4 I have shown why this will do it. Let *a-b-c-d* represent a cross section of the level piece, the pitch being 6 in. to the foot or one fourth as shown. The length per foot run is 13 13/32 in. To lay off the cut on the piece without the use of the steel square, make *d-f* equal to *d-e* and *d-g*, or the width of the piece equal to *d-c*. Draw a line from *g* to *f*, which will be the miter line. Now it will be seen that if we extend this line until it is 13 13/32 in. long and draw another line at right angles to it, as the tongue of the square, this will be just 12 in. long to the line *g-h*.

FORMULA FOR MAKING PUTTY

From W. H. H., Providence, R. I.—Referring to the query of "M. E. H.", Spartanburg, N. C., which appeared on page 92 of the February issue of the paper, I would say that irrespective of the kind of putty used for glazing sash the latter should first be coated with linseed oil or given a priming coat of lead and oil. There are two reasons why putty fails to stick. One is that when it is put on without coating the wood with oil the sash sucks the oil out of the putty. The other reason is that most of the putty on the market is made from whiting, chalk and oil. If the ordinary putty found in hardware or paint stores is used, enough white lead, in the paste form, should be added to bind it together.

The best putty is made as follows: Mix dry white lead to a thick paste with equal parts of quick rubbing varnish and coach painter's japan. Take a heavy mallet, pound and work this paste after adding dry white lead, a little at a time, until the putty is of the consistency that meets your requirement. You may color this putty to match any shade of natural wood by the addition of dry colors. When properly made this putty anchors itself so firmly that if you ever have to remove it you will wish you never had used it.

From C. G. P., Newark, N. J.—Answering the query of "M. E. H.", Spartanburg, N. C., I beg to say the following formula should prove satisfactory as it makes a putty that has stood a thorough test. Mix raw linseed oil and powder whiting in the proportion of 60 lb. of whiting to 1 gal. of oil. Mix in a metal tub, for if wood is used the oil will soak into the wood if allowed to stand any length of time. First throw in some whiting until the proper proportion is reached. When mixed so that it can be handled place on a table or board and knead thoroughly with the hands. Then place it in the tub again and it will keep in good condition for three or four months.

The mixture will be too thin for glazing so it should be worked with the fingers and more whiting added just before applying to the sash. About 5 per cent of white lead may be added, which will increase the adhesive qualities of the putty, but I believe that the oil and whiting mix-

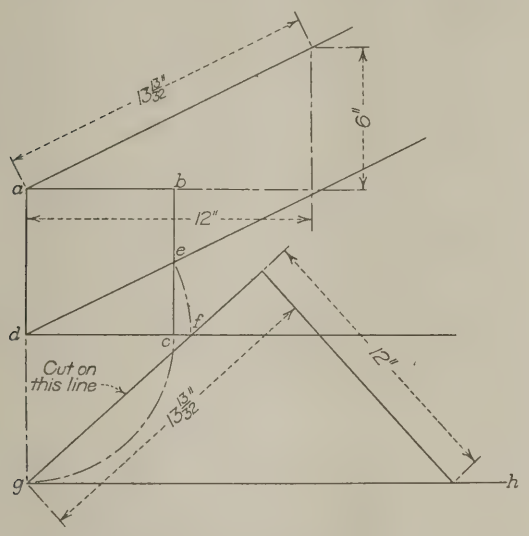


Fig. 4—Showing Method of Using the Steel Square in Connection with a Miter Box

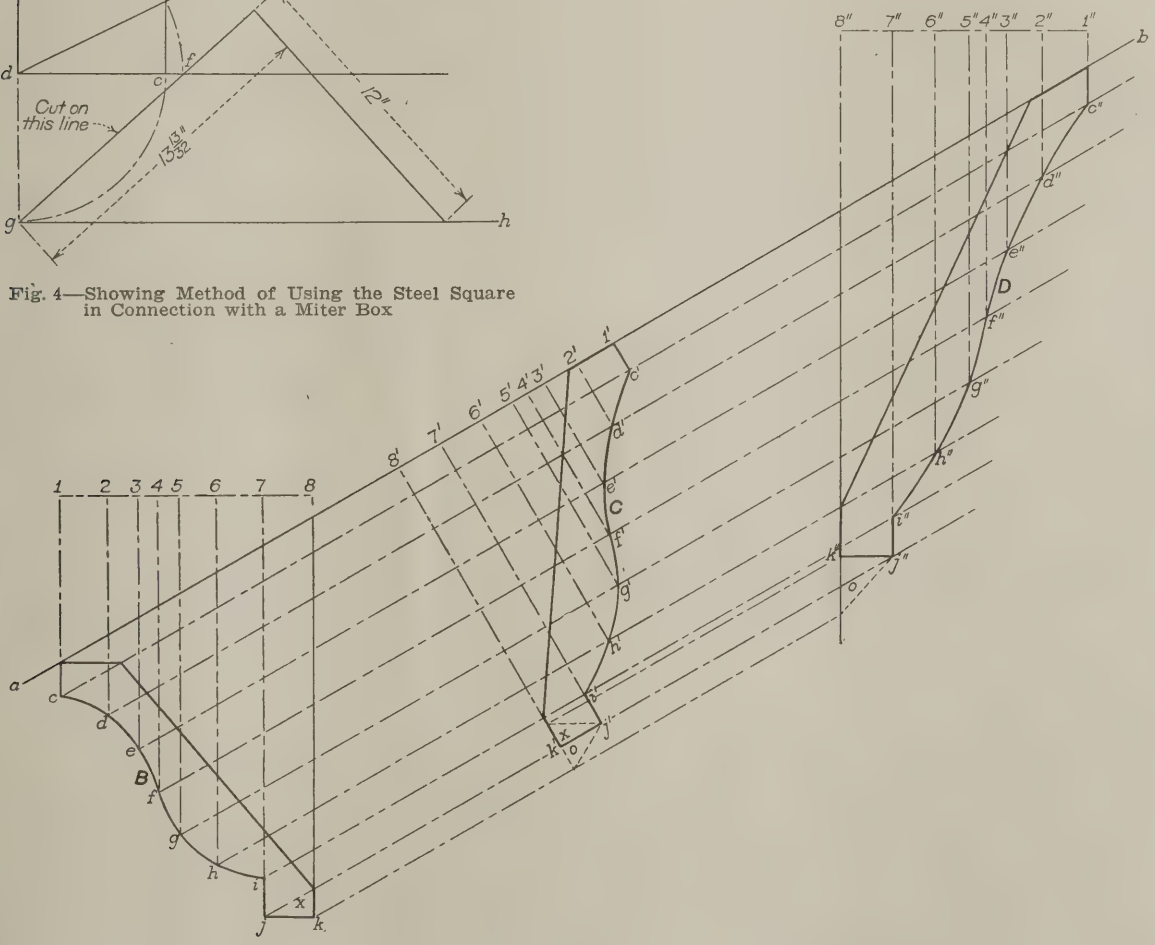


Fig. 3—Diagrams Showing How to Develop the Raking Molding; Also When the Molding Is Used on a Building Having the Roof Sloping Only One Way

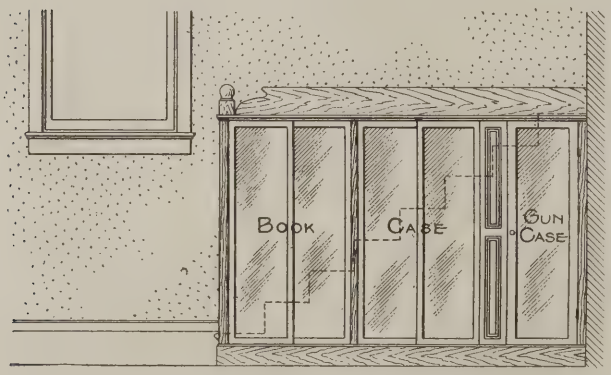
ture will prove entirely satisfactory. The trouble with most putty on the market is that the mixture consists of fish oil and some powdered ingredient of an inferior quality.

From W. M. D., Baltimore, Md.—In reply to the inquiry of "M. E. H.", Spartanburg, N. C., I would recommend giving the rabbets of sash that are to be glazed a good coat of white lead and oil; then he can use most any of the putties on the market with satisfactory results. The above applies to both old and new sash. No putty will adhere to the naked wood.

From W. G. G., Dundee, Ill.—In reply to "M. E. H." would suggest that he try putting some linseed oil in the rabbet before glazing and puttying, and I think that he will then have no trouble with the putty falling out of either new or old sash.

A KINK IN STAIR CONSTRUCTION

From Oscar F. Sampson, Youngs, N. Y.—When a friend of mine built his new home last year, he asked the carpenter to design something new in the way of a stair rail, as he had grown tired of the common form of this portion of the stairway.



A KINK IN STAIR CONSTRUCTION

The workman was a cabinet-maker as well as a carpenter, and the design which he produced met with entire satisfaction, both as regards idea and workmanship. The scheme which was carried out is illustrated in the sketch presented herewith, and I am sending it for the benefit of the readers of the BUILDING AGE who may desire something different from the conventional design.

The stairs were built with an angle turn and a landing the same as is usually the case where room is desired for an entry or vestibule. The main difference consisted in the form of the railing and the finish of the stairway. In this case the stairway is in what may be called the vestibule and opens into a sitting room, through a large opening on either side of which are square columns with lattice or open work.

Instead of the usual rail and balusters on the stairs, these are built with a square newel post and a built-in bookcase and gun rack. The effect of this arrangement is to completely hide the stairway from view in any part of the room until the foot of the stairs is reached. This gives the impression that the bookcase stands in the room by itself, although it be a short distance from the wall.

The bookcase stands about 4 ft. 8 in. high and leads out to the foot of the stairs, probably a distance of 6 or 7 ft. from the partition wall. The top is finished with a carved back board, while the top itself makes a very desirable shelf for bric-a-brac, etc. The front has double glass doors, through which the arrangement of the books can readily be seen, and between this and the gun work are several inches of panel work. Then comes the gun case door, which is also of glass. The entire casing is finished in panels and the work is finished in oak stained very dark to offset hand marks and brought to a flat finish instead of glass. The inside arrangement of the shelving, etc., can be made to suit the taste of the owner. Those who have seen the piece of work here described have spoken highly of it, both for its novelty and utility, and there is no reason why the same scheme could not be carried out in any house. The sketch which I am sending gives an idea of the general scheme.

GETTING OUT CURVED VALLEY FOR GREENHOUSE CONSTRUCTION

From C. G. P., Newark, N. J.—The reply of "C. J. M.", St. Johns, Newfoundland, to my inquiry in the November issue of the paper is incomplete. The method of operations as submitted by "C. J. M." appear to be correct and are very similar to the way I would go about doing the work, but if he will again read the question as it appeared in the November issue I believe he will see that what was wanted was really how to apply the rough timber to the drawings so as to make it unnecessary to set up a model to get out the curved valley members. This is an important problem in my line and a difficult one, so I would be very much pleased if some of the readers could give me the desired information.

DESIGNS WANTED FOR TWO FAMILY HOUSES

From H. V., Sioux Falls, S. D.—Will some of the readers who have constructed houses of a similar nature furnish for publication in the Correspondence Department a few good floor plans of two-family houses containing five and six rooms for each family, the buildings to be erected on lots having a frontage of 22 ft. Any information along this line will be greatly appreciated.

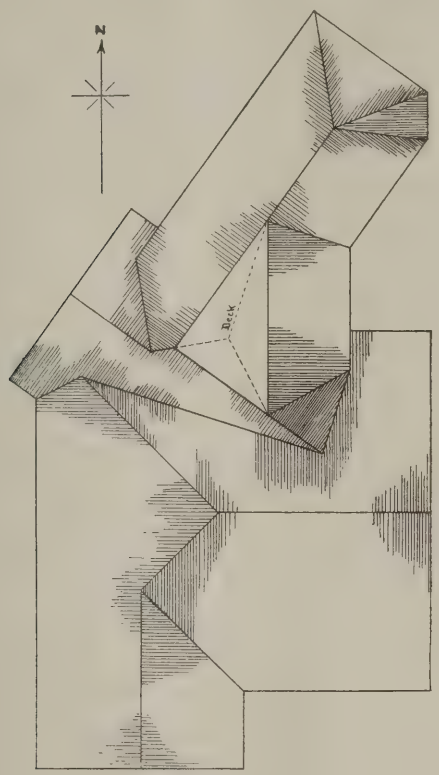
CONSTRUCTING A PORCH FRIEZE

From W. G. G., Dundee, Ill.—I would like to have some brother carpenters give their rule for constructing a porch frieze, and how much smaller they build the frieze than the platform.

DIFFICULT PROBLEM IN ROOF FRAMING

From E. H. B., Hampton Institute, Hampton, Va.—I am sending under separate cover sketches showing roof plan and elevations in answer to the problem presented in the February issue of THE BUILDING AGE by "C. J. M.", St. Johns, Newfoundland. I have tried to keep equal pitch all over the roof. I would, however, suggest a slight pitch to the deck, as indicated by the dotted lines.

It would be interesting if "C. J. M.", who has evidently been dealing with irregular roofs, would let us know how he solved the problem, which he has presented to the readers.

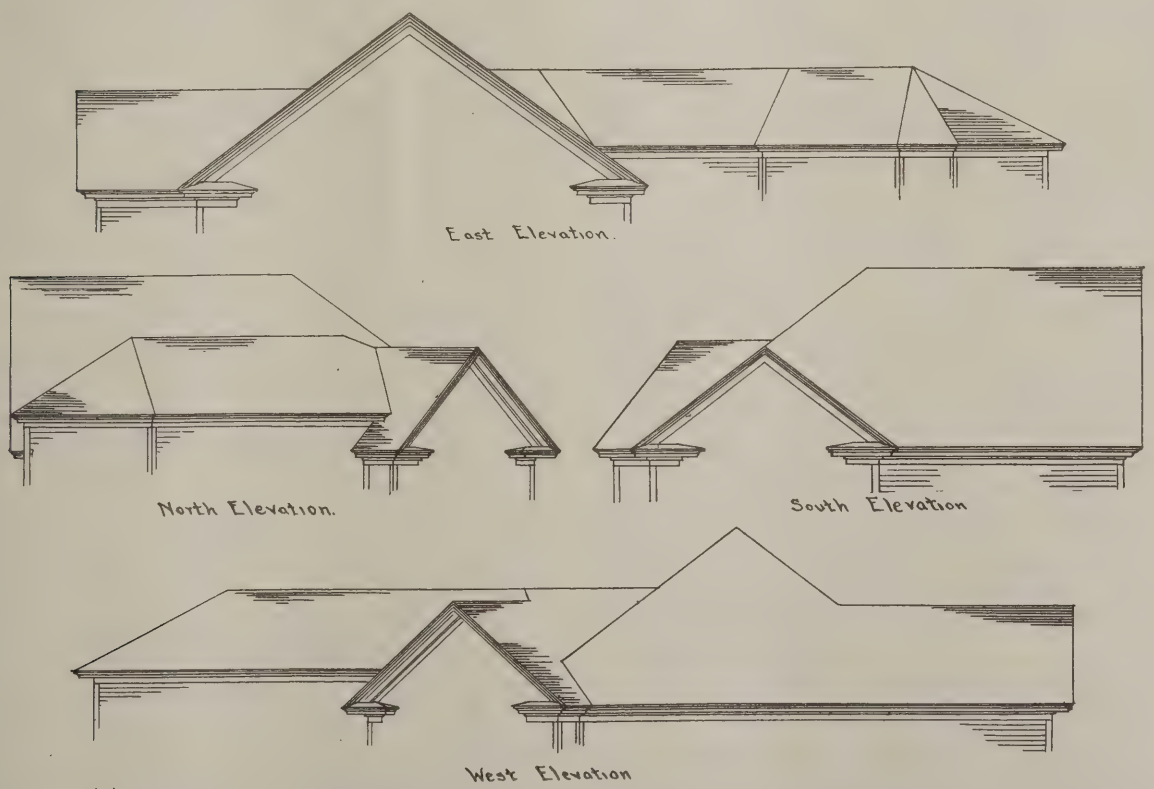


Plan of Roof Showing the Various Hips, Valleys and Ridges

QUESTIONS IN HOUSE CONSTRUCTION

From H. W. S., Duenweg, Mo.—I would like to have the opinion of some of the experts in the building business as to the merits of a house to be built of flint boulders and cement with form inside, and plastered on the inside of the form. The walls are to be constructed of rough boulders and will be 18 in. thick at the bottom and 10 in. at the top of the second story. The partitions will be of lath and plaster. In plan, the house will be 30x36 ft. and there will be two porches. Will such a wall be practically moisture-proof and can the house be easily heated and kept so?

For the benefit of the readers who may make reply, I would say that the work can be done very economically, as the boulders cost nothing, the haul being only a quarter of a mile, and sand is only 50c a load delivered. These conditions make the temptation to build this way very great, provided it will make a good house. I have an experienced and reliable concrete man to do the work and he offers to do it at a low figure. Any comments which the practical readers may see fit to make will be greatly appreciated.



Difficult Problem in Roof Framing—Various Elevations and Plan of Roof as Submitted by "E. H. B.," Hampton Institute, Hampton, Va.

BUILDING AGE

(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

MARCH, 1917

THE BUILDERS' CONVENTION

The fact that at the convention of the National Association of Builders' Exchanges, held in Atlanta the second week in February and a report of which appears elsewhere in this issue, there were represented 6000 members out of a total of 8000 affiliated with the organization, is a striking testimonial of the importance of this gathering. The association is generally recognized as a powerful influence for good in the building industry of this country, and the six years of its existence have been replete with important accomplishments tending to promote improved methods and bringing about a better condition of affairs in the trade. In the list of its important work was the formulating in conjunction with a committee from the American Institute of Architects of the Standard Documents by which many unsatisfactory features heretofore existing in architects' specifications were eliminated and an instrument perfected which is reasonably fair to owner, contractor and architect. At the Atlanta meeting important topics of vital interest to the builders of the country were discussed, including the relationship of the contractor to the architect and to the owner; workmen's compensation laws, the revision of forms for use in submitting contracts and the provision of proper plans and specifications. Immediately preceding the National Convention occurred the usual Conference of Secretaries of the various exchanges affiliated with the National organization, and this was prolific of much good in the wide range of topics discussed, the conference having for its keynote the interchange of ideas of mutual benefit in the management of the associations of builders throughout the country.

THE BUILDING SHOW

As the time draws near for the opening of the National Complete Building Exposition to be held in the Grand Central Palace in this city from March 5 to 11, it is more and more evident that it will prove of unusual benefit to every visitor interested in building construction and in materials entering into work of that character. It will in fact present an opportunity to obtain valuable information regarding home construction, and from an educational standpoint it will undoubtedly offer object lessons in the economical construction of home buildings while at the same time affording hints and suggestions how to make the home attractive. One of the features which commanded unusual attention at the initial exposition held in Cleveland last year, and which is intended to be repeated at the coming New York show upon a still more elaborate scale, are the "community exhibits" showing various developments in their special lines and clearly demonstrating the utility of the materials involved in connection with actual building construction. Stability in construction and more careful supervision of new buildings in the future will undoubtedly be advanced through the presentations which are to be made at this exposition. The movement for safe building is gaining a national recognition and several papers on this important subject will be considered. Many devices have been invented to insure safer construction of buildings, and these, with other displays of importance to the industry, will be found among the features of the show. We understand that arrangements have been made with the various colleges in and about the city to send classes to the exposition to study the building situation and thereby obtain a more accurate knowledge of the industry. From present indications, the displays of building materials, models of attractive architecture and other features of an educational nature along these lines will make the exposition of widespread interest and value to visitors generally.

NOVEL APARTMENT HOUSE PLANNED BY WOMAN ARCHITECT

A new apartment house demonstrating the feminine idea of correct planning has just been designed by Miss Josephine W. Chapman, architect. The sixteen story structure is to be located on Park Avenue, New York City, and many innovations are to be introduced.

The kitchens are to be in white porcelain and no flame of any kind is to be permitted, as it would tend to eventually soil the porcelain. Instead, electricity is to be used for cooking, for the running of a new type of refrigerator, for a dish washer, ironing, clothes washing machine, clothes wringer, vacuum cleaner, etc. The odors arising from cooking are to be disposed of by an electric ozonator. Eectric conveniences are also to be provided for in the bathrooms and other rooms. Each apartment is to contain an open fireplace.

The center court is to be fixed up as a flower garden, with tea tables in summer and a glass enclosed cloister for all year round use. Apartments facing on inner courts are to have balconies. Individual vestibules from the elevator shaft are to replace the usual long hall.

VALUE OF TRADE PAPERS TO BUILDERS

The following comments on the above topic were prepared by A. V. Williams, Secretary of the Builders' Exchange, St. Paul, Minn.:

"In the files of every active builders' exchange are found the leading publications relating to the building industry. These publications play an important part in the success of these organizations. Members refer to them, the public consult them, but the chief use of the publications is made by the builders' exchange in carrying on its work.

"Trade magazines and trade papers in the building lines furnish information of greater value than those of any other business, not only in the volume of business reported on but the worth of the same. They tell, as no other publications do, of the growth and development of all districts of the country. They furnish news of a character which is the surest barometer of business conditions. They form one of the most important and valuable parts of the life of the building industry. Each week their columns indicate in hundreds of directions and fields where and of whom and when to seek business.

"Without the information contained in these publications those operating in building lines would be in much the same position that they would without the railroads. Their field of operation would be largely limited to the district in which their business is located, and when news of what was doing in other localities reached them the contracts would have been awarded, the buildings under construction and the material and equipment sold.

"It is part of the work of the Builders' Exchange to aid its members in securing every opportunity to advance and improve their business; one of the important means of doing this is to be in position to furnish them with information relative to building prospects, contracts let, etc. These publications furnish the basis for this work. Promptly and properly used, the pages of the same give each week information of the very highest value."

WAGES IN THE BUILDING TRADES

The prevailing rates of wages as published by the United Board of Business Agents of Manhattan and Vicinity, New York City, under date of Feb. 5, 1917, are as follows, the schedule being based on 8 hours' work per day, except on Saturday, when work in the building trades ceases at noon:

Asbestos workers, boiler felters, pipe coverers, insulators	$5.00
Asbestos workers' helpers	3.00
Blue stone cutters, flaggers, bridge and curb setters	5.00
Blue stone cutters' helpers	3.00
Blacksmiths	5.50
Bricklayers	6.00
Bricklayers' helpers	3.40
Carpenters and framers	5.50
Cabinet makers	5.00
Cement and concrete masons	5.60
Cement concrete and asphalt laborers	3.00
Derrickmen and riggers	5.00
Decorators and gilders	5.00
Decorative art glass workers	5.00
Elevator constructors	5.52
Elevator constructors' helpers	3.52
Electrical workers (after April 1 $5.20)	5.00
Electricians' helpers	2.50
Electrical fixture workers (after April 1, $5.20)	5.00
Engineers, stationary	5.00
Engineers, portable, hoisting, etc., $30.25 weekly—by the day	6.00
Engineers on boilers, pumps or pile driving machines, per week	30.00
Engineers on steam rollers, also on foundation work, per week	33.00
Engineers on all excavating, broken time, $30 weekly —by the day	6.00
Framers	5.50
Granite cutters	5.00
Glaziers	4.00
House shorers, movers and sheath pilers	4.00
Housesmiths, bridgemen and structural ironworkers	5.50
Housesmiths, bronze, metal furniture and metal trim workers	5.50
Housesmith's helpers (after September 1, $4)	3.80
Ironworkers' apprentices	3.00
Metallic lathers	5.50
Marble cutters and setters	5.50
Marble carvers	6.00
Marble polishers	4.70
Marble sawers	4.68
Marble bed rubbers	5.00
Marble cutters' helpers	3.50
Rigging	4.00
Crane operators	3.75
Mosaic workers	4.75
Mosaic workers' helpers	3.00
Machine stone workers	4.50
Paper hangers	Price List
Pattern makers	5.50
Plate and sheet glass glaziers	4.00
Plasterers, plain and ornamental	6.00
Plaster modelers, weekly	$30 to $100.00
Plasterers' helpers	3.50
Plumbers and gas fitters	6.00
Painters	5.00
Painter-decorator, painter-stripper, painter-girder	5.00
Painter-letterer, painter-grainer	5.00
Riggers on machinery, dynamos, boilers, etc	5.00
Roofers, tar, felt, composition, damp and waterproofers	4.50
Rockmen (after April 1, $3.04)	2.80
Rock drillers and tool sharpeners (after April 1, $4)	3.75
Sheet metal workers, coppersmiths, tinsmiths, metal roofers	5.00
Slate and tile roofers	5.50
Steam, hot water and general pipe fitters (after July 1, $6)	5.50
Steam fitters' helpers (after April 1, $3.20; after July 1, $3.40)	3.00
Tile layers	6.00
Tile layers' helpers (subject to change)	3.25
Varnishers	5.00
Wood lathers	6.00
Wood carvers and modelers	5.50

Compensation for a practical foreman ranges from 50c. to $1.00 per day over and above the schedule as shown. All recognized legal holidays and Sundays to be figured at "double time."



VIEW IN ATLANTA, GA., SHOWING PIEDMONT HOTEL, THE CONVENTION HEADQUARTERS, DIRECTLY IN THE BACKGROUND

THE SIXTH ANNUAL CONVENTION OF NATIONAL ASSOCIATION OF BUILDERS' EXCHANGES

MANY VITAL TOPICS TO BUILDERS DISCUSSED—MEETING A HUGE SUCCESS—ATTENDANCE BROKE ALL RECORDS—SECY. SCATES RETIRES

WHAT was characterized by all who attended as the most successful convention in the notable history of the National Association of Builders' Exchanges was the sixth annual meeting of that organization held in Atlanta, Ga., on Feb. 13, 14 and 15. From the standpoint of attendance the gathering broke all records, while in point of interest and important matters considered the convention has had few, if any, equals. With an aggregate membership of over 8000, represented by thriving exchanges in all parts of the country, the association has come to be regarded as a powerful agency for the betterment of conditions in the building industry of the United States. This was evidenced by the great variety of subjects discussed and acted upon at the convention, some of which were made the basis of carefully prepared reports and addresses of vital interest to all men engaged in this industry.

RESULTS ACCOMPLISHED

The relationship of the contractor to the architect and to the owner; the provision of proper plans and specifications for building work; the revision of contract forms; workmen's compensation; national legislation—all these and many other topics received their share of attention. While business was made the central feature of the meeting the builders thoroughly enjoyed a program of entertainment typical of true Southern hospitality provided for them by the Atlanta exchange. Many of the Northern exchanges made the visit to Dixie land the occasion of special excursions, which carried large parties of members and their families to the convention city. Among these were Detroit, New York, Baltimore, Washington, Norfolk and Columbus. The Detroit crowd numbered 125 traveling in a special train which included visits to Louisville, Chattanooga and Nashville en route to Atlanta and proceeded to New Orleans for the Mardi Gras following the convention. The delegates from Eastern cities stopped en route at Asheville, N. C., while several other parties visited the Mammoth Cave.

Although some of the delegates were disappointed not to find warm and balmy weather in the "Sunny South," the thermometer having just paid a visit to zero previous to the opening of the convention and not manifesting any particular haste in leaving that rather low mark, the skies were for the most part clear, and the conditions favorable for enjoying outside life.

FEATURES OF ENTERTAINMENT

A considerably larger number of ladies attended this convention than ever graced any previous meeting, making the social features by no means the least enjoyable. A special committee of the wives of Atlanta builders served as hostesses providing a very attractive program of entertainment. These delightful affairs began with a reception in the ballroom of the Piedmont Hotel, convention headquarters, on the evening of Lincoln's Birthday, at which the national officers and distinguished guests were officially welcomed. Music and dancing made the evening a lively one. A luncheon at the Winecoff Hotel, followed by an automobile ride to the Cyclorama of the Battle of Atlanta, Grant Park, Fort Walker and Burn's Cottage kept the ladies busy on Tuesday until a theater party was conducted in the evening. Another luncheon at the Piedmont Driving Club with an afternoon automobile tour, were features for Wednesday, the evening being devoted to a Valentine Ball at the Capital City Club.

On Thursday the party was again tendered a luncheon; this time at the East Lake Country Club, followed by a visit of inspection to the United States Penitentiary. "Old Plantation Night" in the main dining-room of the Piedmont Hotel on

Thursday evening, made a big hit, closing the convention program. Many of the delegates and their wives were guests of the Blue Ridge Marble Company on Friday, taking a special excursion train to the company's quarries where they were pleasantly entertained. A special train proceeded to New Orleans for the accommodation of a large number who took advantage of the opportunity to visit the Mardi Gras, this train leaving Atlanta on Saturday and being parked in the carnival city, thus providing hotel facilities.

After a lively competition with Cincinnati, the delegates from Pittsburgh landed the next convention for their city. This recognition came after R. K. Cochrane, of Pittsburgh, had been elected president of the association with the understanding that E. M. Tate, secretary of the Pittsburgh Builders' Exchange, would be appointed secretary of the association, the Smoky City thus carrying off a lion's share of the honors.

Secretary Scates, after almost continuous service for the national organization since its inception, asked to be relieved of further duties as secretary, owing to increasing obligations as active manager of the Baltimore Builders' Exchange. A testimonial to his efficiency and devotion to duty was adopted by the convention.



PRESIDENT R. K. COCHRANE
OF PITTSBURGH, PA.

OPENING SESSION TUESDAY

A crowd which overtaxed the large Cable Concert Hall, where the business sessions were held, characterized the initial assembly, called to order by President John Trainor shortly before 11 o'clock on Tuesday morning, Feb. 13. All the available chairs were occupied and a hundred or more people were compelled to stand around the edges during the exercises. The large attendance was very pleasing to the national officers, especially since the bright sunshine of a typical Georgia day conduced to outdoor recreation. Many ladies were present—a fact recognized in various references by the speakers.

An invocation was pronounced by Rev. W. W. Memminger, D.D., a prominent Atlanta clergyman, who in a fervent prayer asked for divine guidance of the proceedings. On account of appointments to meet visiting delegations from other parts of the state Governor Nat E. Harris deputized Prof. J. T. Derry of the Department of Commerce and Labor to express the greeting on behalf of the state. He said in part:

"I consider it a great honor to welcome you builders of the nation in the name of the great empire state of the South. This title belongs to Georgia on account of her many great enterprises and the wonderful progress she has made. The late unpleasantness, as we used to call it, has happily long been forgotten and to-day we stand as brothers and Americans. With her sister states Georgia stands for peace and unity in support of our President and our flag. Speaking to you as an ex-Confederate, I am glad to emphasize this principle and to tell you what Georgia has done and is doing to sustain it. She has given to the country some of her most illustrious men. Blended as we are from the Cavalier and the Puritan stock, we get not only the true Georgian but the true American in our sons and daughters. On the part of this great state I bid you a hearty welcome."

Similar sentiments were expressed by Hon. Asa G. Candler, mayor of Atlanta, who in an eloquent address continued the greeting:

"I am greatly pleased," he said, "to meet so large and representative a body of builders and have them as our guests for a few days. Atlanta is but a child among the cities of America, but she is growing. When you recall that in 1865 this entire site was burned and that the modern city you now look upon has arisen from the ashes you can better realize the Atlanta spirit. This result has been achieved partly if not largely by the efforts of the builders. All that is visible of this magnificent city of 200,000 population has been erected by such men as you. We welcome you to this city as bretheren with whom we are glad to break bread. It is a pleasure to greet men who are high in the arts of peace. We want to make your stay so pleasant and your meeting so successful that we will have no cause for jealousy when you go to other cities in the future for your annual sessions. We recognize in you a most important part of American citizenship. It means much in these days of destruction abroad to be an American builder—men who are building cities upon the hills as examples of harmony and peace."

In a very happy manner President Charles W. Bernhardt of the Atlanta Builders' Exchange followed the public officials and after expressing a cordial welcome he said:

"We hope to show you on Saturday some of the beautiful scenery of our state, including the largest single block of marble in the world. That is the rock upon which Dan Carey told you in Baltimore a famous general once stood and declared that in 1917 Atlanta would have 200,000 population and get the national convention of builders. We wanted you to come and see our great natural resources and also to permit us to demonstrate to the South the importance of this organization in protecting and promoting our industry. The latch-string is out at every Atlanta home. If there is anything you want that you are not getting, just let us know, and if you really ought to have it we will see that you get it."

President Trainor responded to the speakers, expressing the appreciation of the association.

"As we travel through the country and view the buildings along the way we can readily determine what kind of people live here," said he. "By this token we have already given Atlanta a high place among the cities of our land, for you certainly have some well designed and modern structures. But best of all are your hospitable homes. In all this class of building our association is endeavoring to work out improvements. Our efforts to standardize documents, to modernize building laws and to obtain other reforms are working out beautifully. The underlying principle in all of this is to see that men get what they pay for when they build and in turn that they pay for what they get. In this way we hope to get better results for our own tradesmen and also for the public generally. We have found the architects most willing to co-operate with us in doing away with uncertainties in building work and have also had valuable aid from the bonding companies. In some cities it is now required that bonds shall be given to insure the payment for contracts completed the same as it used to be required that bonds should be given for the completion of such contracts. Many things require home rule in individual cities, but such things as can be handled generally by an association such as ours I believe are being thus considered, or will be taken up as we go along."

At this point President Trainor introduced John Lawrence Mauran of St. Louis, president of the American Institute of Architects, who delivered an

address on "The Golden Rule." In part he said:

All mankind has one or another task or duty in common with his neighbor, but it is only of late years that our best citizens realized either the responsibilities of the service we owe our fellow men, or were willing to grant for a moment that we have a common heritage; and so, it is scarcely surprising that you, the master-builders of the country, and we the architects of the very buildings you were rearing in steel and masonry, should fail to see through the cloud of petty details—and some of them I must admit were "full sized"—but details none the less of divergent interests, into the heart of things where builder and architect are first of all *men*—men with the same God-given rights—the same common responsibilities and the same ambition and aim to serve the man who makes their common effort possible. I always like the theory which my predecessor and, I venture to say, our mutual friend, Mr. Sturgis, has spoken of to you "that no matter how widely men may think they differ, personal contact in discussing those differences is bound to establish points in common which grow until those differences are dissovled in an atmosphere of understanding.

Relation of Architect to Engineer

Just a year ago when your convention passed those splendid resolutions to aid me in my fight against the erection of the power house in the park area of Washington, I had a striking instance of this truth. Perhaps you know the very general feeling which has always existed between architects and engineers, the engineer looking upon the architect's work with a certain amount of disdain because engineering is an exact science and architecture has so wide a latitude that the slide rule cannot well cover its possibilities. On the other hand, the architect has always felt that the engineering problems incident to building are handled by the engineering profession with a rigidity which evidences a lack of sympathy in what should be a mutual effort, and hence—when five of the most distinguished engineers hurried to Washington in response to our invitation we naturally felt that we could count on their interest in so far only as the power house might appeal to them as a poor *engineering* proposition. So you can imagine our surprise—our delightful surprise—when we found them individually and collectively opposed to the erection of this unsightly array of smoke stacks in the Park area, not only from a strictly utilitarian viewpoint, but more particularly on account of their appreciation of the fact that it would be a blemish on the face of our beautiful Washington from an artistic standpoint. Here again, personal contact brought out a surprising number of viewpoints common to both professions and when I suggested to some of these men that there onght to be an established means of co-operation on those new found interests, the idea was enthusiastically received.

A Joint Conference Committee

As a result, I am engaged in forming a sort of "Clearing House" or "Forum"—a Joint Conference Committee of architects and engineers to make permanent the cordial relations established at that time. Even if you have never stopped to think of it before, you must have noticed that while the bridges and viaducts designed and erected by engineers for many decades were scarcely "things of beauty," no matter how perfect the engineering solution of the problem might be, there have been built more recently structures for the same purpose just as perfect in combination of economy and strength, but through the association of an architect in the problem, embracing lines of beauty and accessories of interest which have made them real monuments to their joint designers. This is but one of the many fields of common interest to the two professions and the dawning of a new day of co-operation is typical of this era of "getting together" which all of us believe points to a rapid constructive progress impossible under the old regime.

Builder vs. Architect and Owner

Now all of you remember the old order of things, which our labors together have done so much to revolutionize—except in the offices of architects of the highest type, the master builder found himself on the one side and the owner and architect on the other. Wherever the fault lay, whether with the architect in defending drawings insufficiently explicit, or with the builder in exacting the last extra the "traffic would stand," is now happily of no consequence, for in the last analysis the fundamental trouble was that neither architect nor builder realized that "understanding" and "co-operation" are essentials to success within the grasp of both. Our disinterested labors together over the Standard Documents has proved the *fact*, and their usage has emphasized its application. The Standard Documents come nearer than anything else to stating in legal form the true instinctive relationship between men of the highest ethical standards—both in the field of construction and of creation.

The Successful Bidder

I am sure every builder here present has seen that excessively clever cartoon of the "successful bidder"—the builder who has just read the letter informing him that he has been successful in landing a big job, depicted in a state of complete collapse, vainly cudgeling his brains as he stares wild eyed into space—for the answer to the question escaping from his lips "what *did* I forget?" Now that truism, for it is a trusim—is all wrong. No right-minded owner wants to profit by human fallibility—no decent architect wishes to see his co-worker the victim of an oversight, nor is it pleasant to enforce the proper applications of the terms of the contract under such conditions, and most of all it is hard for the builder to show a broad-minded interest in a contract which like the unbaptized Presbyterian infant is thus "damned at its birth." Some way will be found to overcome this common evil and the friends of the Quantity Survey claim that their system is the "cure all" that will prove efficacious. They may be right—very likely they are—you have evidenced your interest and have suggested co-operation between our organizations to determine its value.

Quantity System of Estimating

The American Institute of Architects has been interested for a long time in this method which has been in vogue in other countries for a great many years but it has felt no compelling impulse to accept or reject the principles involved. It undoubtedly has its merits and it undoubtedly has its shortcomings, which must be as apparent to you as it is to us, and our board of directors had determined to take no definite action until we could observe the workings of this system on some typical job from the time the drawings were ready for the Quantity Surveyor to the moment of adjustment of the final certificate. I know it will be of interest to you to learn that such an opportunity has just come to our notice and I have appointed three conscientious, painstaking members of the Institute a Special Committee to make this observation for our mutual benefit and to report its findings to the Board of Directors.

As we meet here to-day our country stands upon the brink looking into that hell's cauldron of war which has convulsed a divided Europe. Whether national honor forces us over that fateful brink or happily we remain in honorable peace with our friends and brothers throughout the world—let us thank God we learned our eternal lesson in that baptism of blood and fire which settled forever in 1865 whether it should be "United we stand," or "Divided we fall"—and made absolute the assurance that through the years to come there stands Republican and Democrat, bricklayer and banker, merchant and manufacturer, builder and architect,



PANORAMIC VIEW, IN THREE SECTIONS, OF DELEGATES ATTENDING THE SIXTH ANNUAL CONVENTION OF NATIONAL ASSOCIATION OF BUILDERS EXCHANGES HELD FEBRUARY 13, 14 AND 15 IN ATLANTA, GA.

a vast army united as one man behind our constituted authority—the President of these, *our* United States.

STANDING COMMITTEES

Mr. Mauran's address was frequently interrupted by applause evidencing the appreciation with which it was received by the builders. In the few minutes which intervened before the noon recess, Secretary Scates announced the roster of standing committees for the convention, as follows:

Auditing Committee—William F. Chew, chairman, of Baltimore.

Credentials Committee—Fred G. Webber, chairman, of New York.

Resolutions Committee—Edward A. Roberts, chairman, of Cleveland, Ohio.

Assistant Secretaries—E. M. Tate, of Pittsburgh; Edward A. Roberts, of Cleveland; C. P. Massard, of Des Moines; George L. Wadsworth, of Norfolk, and John Houck, of Indianapolis.

Sergeant-at-arms—S. F. Bennett, of Baltimore.

Assistant Sergeant-at-arms—J. M. Vollmer, of Louisville, and J. H. Jennings and R. M. Walker, of Atlanta.

TUESDAY AFTERNOON SESSION

At the opening of the afternoon session the committee on credentials filed a report showing a membership of 6000 represented at the convention out of a possible 8000 total enrollment in the association. The largest individual organization represented was the Building Trades Employers' Association of New York City, with 704 members, and the next largest the Builders' Exchange of Philadelphia, with 684 members.

Considerable enthusiasm characterized the introduction of H. L. Lewman, of Louisville, former president of the national organization. The delegates gave Mr. Lewman a Chautauqua salute and a cheer as he arose to deliver a special address prepared for the occasion. His remarks were followed by a like demonstration indicating the high esteem in which the former chief executive is held by the builders of the country. His references to the need of a closer study of employment conditions were especially well received.

PRESIDENT TRAINOR'S ADDRESS

The annual address of the president of the association was then delivered by President John Trainor, of Baltimore. It dealt with affairs of the building contractor as well as with matters of importance to the Association and received marked attention. Following are important extracts:

The business world, I believe, is beginning to realize the great importance of co-operation in the building, as in other lines, and when we consider that there is more money invested in the building business, more technical and practical knowledge required in its construction and maintenance than any other single industry on earth and as everything now is moving in the direction of better economic conditions, the necessity for co-operation is recognized more and more every day, to the end that the rough places in the building game may be made smoother and the relations between architect, owner and contractors of every type may be made more equitable and secure.

The reforms that have been inaugurated by this Association and its affiliated connections have contributed vastly to that much desired result, and as revolutions do not move backward, nor can we become children again, whoever will candidly review the career of our Association and its present status will realize that it has already arrived at the stage of vigorous manhood.

Year after year our meetings have grown more businesslike, with an increased fraternal feeling and an enthusiastic determination to excel in our line. Year after year the business world with whom we deal, and indeed the community itself, is coming to recognize the value of our efforts in improved business methods, by the process of rendering ourselves more worthy of their confidence and in these efforts, we have at least been consistent, honest, active and fairly successful.

There are some points which I regard as most essential to our success, which cannot be too frequently repeated or too often discussed.

Standard Documents

One of these points is the perfecting of the Standard Documents with the American Institute of Architects, and a campaign for their general introduction and use in every State in the Union where our members do business. Owing to the very nature of the case it is through the individual Associations and State Exchanges that the active work of a body of this kind must be done. This is self-evident from the fact that the general introduction of the documents or any other reform must be had through them. If the members will insist on their use wherever possible, when they are signing up their contracts, it will be the very best method of securing from them the greatest amount of benefit and protection.

Our relations with the American Institute of Architects continue to be most cordial. We have held several conferences during the term—these conferences were mainly for the purpose of having a better understanding of the terms of the Standard Documents as to the operation and responsibilities of the bonding companies. Substantial progress is being made.

Ethical Practice

There can be nothing of greater importance to the building trades than the compilation and adoption of a Code of Ethics for a safe and sane method of figuring estimates and executing contracts, whether between the owner, the architect, the general or sub-contractor, and our Committee is now at work on this important subject and I commend their report for your careful consideration, as with a proper code equitably drown and supported by arbitration, as provided in the General Contract Documents, such provisions would make the building business move in the direction of square and honorable dealing through its entire ramifications.

With these foundations and understandings, we should be in position to inherit all the advantages sought to be obtained in Sec. 3 of our Constitution, which aims to lay the foundation for equitable dealing between all interests in the building trades, with the principles of Home Rule in full swing, which is the fairest and wisest provision that could be granted to the people of the various centers of activity in our country; because of the various conditions that exist in the expanse of territory that we cover, Home Rule is essential to the peace and prosperity of Local Associations. With the great National as a Clearing House, what a splendid intellectual combination for progressive and economical development.

Membership

I am pleased to advise that we have held our old membership of a year ago in an almost unbroken column, which speaks well for the future. At the same time, we have made substantial gains in additional membership and in new Associations and this in the face of

the fact that you will bear in mind that we were liquidating an indebtedness during this term, which confronted us a year ago; hence, we did not have an opportunity to indulge in a campaign for recruiting.

The substantial gains which we have got came through various activities, namely: the efforts of our National officers and State Commissioners, in the main. We have gotten in some splendid new Associations, not the least of which is our warm-hearted friend, Secretary Roberts of Cleveland, with his galaxy of trained veterans as Association workers. If these and the other recruits which we have received do not make their influence felt in the extension of our good work, I have missed my guess. Secretary Roberts was with us in Washington some years ago when we were organizing this Association; hence, the work will not be altogether new to him.

Finance

Owing to the extraordinary expenses which we incurred in the two previous administrations, made necessary by the exigencies of the times, we have made a very determined effort to so conserve your funds that we might have a balance on the right side of the ledger this time, be it ever so small, and I believe we have succeeded, as all of the old bills are paid, although I am uncertain at this hour what will be the the net balance at the close of this Convention. I am confident, however, that it will be on the right side—your financial officers will furnish the details.

As kindred to this subject, I desire to record myself as a firm believer in the wisdom of keeping down the expenses of this great Association as the surest means of continuing its activity and increasing its usefulness.

I desire especially to focus your attention on the following enterprises:

Economy in Matter of Entertainment

The perfecting (with the American Institute of Architects) of the Standard Documents, as defects may appear. I would strongly recommend that the incoming officers take up for further consideration with the bonding companies of the United States the question of writing bonds under the new form of contract, and trying to persuade them to use these bonds in preference to the old forms.

Home Rule

The principles of Home Rule should be kept constantly to the fore and the activities of Local Associations or Exchanges focussed upon it. In fact, I would earnestly recommend that all of the principles provided for in Sec. 4 of our By-laws, be constantly kept in mind by Locals, as it is through their merits must come whatever good the Association is capable of producing. These principles make a splendid catechism for new and old members alike and for ready reference they are stated below:

First—Constant attention to Legislation, Municipal, State and National, that may in its character correct abuses and protect public interests.

Second—Co-operation with the various Associations of Architects, Engineers, and kindred organizations, in the accomplishment of the objects of this Association as set forth in Section 3 of this Constitution.

Third—The establishment and fostering of Trade Schools.

Fourth—The promotion of uniform Building Laws as far as practicable.

Fifth—To encourage the merit system, and upon the basis of this system the settlement of all industrial disputes by mutual and amicable arbitration.

Sixth—To encourage a friendly relation between employer and employee as necessary for the permanent success of both.



SECRETARY E. M. TATE
OF PITTSBURGH, PA.



TREASURER CHARLES W. BERNHARDT
OF ATLANTA, GA.

Finally, in taking my leave of you and handing back the mantle of authority which you gave me, I beg to assure you that it has been my effort to promote the welfare and increase the dignity of your Organization at all times. I am naturally an Organization man, having spent a vast amount of time considering and promoting the welfare of Associations; hence, I believe in them. I further believe that organization of the various crafts and industries of our country has done as much, if not more, for the advancement of industrial liberty, than all other causes combined.

EVENING ENTERTAINMENT

In the evening the delegates and their ladies attended the theater as guests of the Atlanta Builders' Exchange. Moving pictures, illustrating the attractions of Pittsburgh as the next convention city, were shown as a curtain raiser. During a vaudeville performance much merriment was caused by frequent "hits" on prominent men in attendance; toy balloons were batted about and a general period of jollity

was engaged in. The visitors occupied the entire main floor of the theater and a number of the boxes.

WEDNESDAY MORNING SESSION

An interesting account of the year's work of Secretary I. H. Scates emphasizing the strong physical condition of the association was the opening feature of the third session of the convention. This followed a statement of the financial operations for the year, a credit balance of $800 with all bills paid evidently pleasing the delegates. Several important undertakings of the national organization during the year were reviewed by Mr. Scates, who also made a number of recommendations for consideration by the incoming officers.

REPORT OF SECRETARY SCATES

In passing from the financial to the physical report of our Association, I want to express my thanks to the affiliated organzations for the splendid response which we have had from them to our requests for the prompt payment of the per capita tax. We have had in this the assurance of co-operation and appreciation on the part of the officers and members of the affiliated associations of the necessity of promptness in the payment of dues in order that the current accounts may be met promptly and our credit as an Organization maintained.

It is my pleasure to report an increase in membership during the year, the following Exchanges having been added to our roll:

Builders Exchange, Montgomery, Ala.
Contractors & Builders Exchange, Reading, Pa.
General Contractors Association, St. Petersburg, Fla.
Building Industry Club, St. Joseph, Mo.
Master Builders Association of Nebraska, Inc., Omaha, Neb.
Master Builders Association, St. Louis, Mo.
Builders Exchange, Cleveland, Ohio.

Making an addition of 643 members in our Association, giving us a membership of approximately 8000.

We are sorry to report the resignation of the Contractors and Dealers' Exchange of New Orleans, La., and the Master Builders' Association of Baltimore, Md.

These resignations are largely due to local conditions rather than to any lack of interest in the work of our National Association.

It is my pleasure to be able to report regarding the use of the Standard Documents that we have information from the executive secretary of the American Institute of Architects, E. C. Kemper, stating that during the past year upwards of 40,000 copies have been distributed—a very marked increase over that of the year previous. I cannot too strongly urge upon the secretaries and the officers of the affiliated organizations the need of their insistence among their membership of the use of these documents.

Considerable work has been done with the bonding companies during the past year. On Jan. 13, I forwarded to the bonding companies of the United States a request that they should urge the use of the New Standard Documents, and further that in all cases they will, upon executing a bond, insist upon an arbitration clause similar to that provided in these documents.

I am pleased to report that a large percentage of the bonding companies have favored us with a reply. The majority of those replying were in fullest accord with our request regarding arbitration.

The work of the Secretary's office could be lessened and the record of membership could be made more positive than under our present system by a rule instructing or a by-law making it obligatory upon the secretaries to forward to the National Secretary on June 1 and Dec. 1, on blank to be furnished, the number of members in good standing in their local exchange or association on which they are to pay a per capita tax.

There is a growing demand for information regarding the work and purpose of this National Association. In this connection I would suggest that the publicity committee should edit and publish for distribution folders and circulars, giving data regarding our work, its membership, benefits, etc., and a pamphlet of suggestions in a general way on "How to Organize and Maintain an Exchange." Printed matter of this character would be of great value in educating those in the building trades in cities and towns not at present organized, who are desirous of information along these lines. It would also lessen materially the work of the Secretary, who at times has pages to dictate and communicate on these subjects.

Another suggestion which might be made profitable to this Association is the compilation and publication of a National Association directory, giving a classified list of members of each affiliated exchange, to be corrected annually and kept up to date. This publication would not be for free distribution, and would, I believe, meet with a very ready sale at a nominal price.

A PATRIOTIC RESOLUTION

A budget of reports from the field commissioners was recapitulated by President Trainor who said that they had been largely covered in the addresses of the executive officers. A wave of enthusiastic patriotism swept over the convention when Colonel John R. Wiggins, of Philadelphia, arose at this point and asked the privilege of presenting a resolution in special order. This resolution seemed to immediately strike a popular chord, for it was adopted amid scenes which have seldom been witnessed in the national assemblies. Men cheered and waved their hats as Colonel Wiggins finished the reading of the following:

"Whereas, the President of these United States of America has been forced by the failure of the Imperial German Government to recognize his protest against her ruthless submarine policy to break all diplomatic relations with that government, be it

"Resolved, That we the National Association of Builders Exchanges endorse this action of the President and offer our aid to the extent of our resources, our ability and our lives in every action he may take to preserve the life and liberty of Americans on land or sea.

"Resolved, That a copy of this resolution properly authenticated be forwarded to the President."

The foregoing was offered with the endorsement of the Philadelphia delegation and was adopted by a rising vote unanimously.

An address by W. B. King, of Washington, D. C., legal counsel of the association on "Workmen's Compensation Laws," was next on the program. Mr. King reviewed the conditions existing prior to 1910 when the New York state law was enacted. He said that now thirty-one states out of the total forty-eight had workmen's compensation laws.

In general these were of two classes—the compulsory laws and the elective laws. The speaker expressed the belief that the balance of the states would soon fall in line with this kind of legislation designed to follow the principles of making industry carry the burden of accidents and the compensation of those unfortunate enough to be the victims of the same. He advised contractors to study the laws in their respective states with a view to having them improved where necessary and where no such laws now exist to have a part in framing them. He particularly warned the builders against what he termed "crank legislation." He gave a large number of illustrations of decisions and claims set up under these laws, some of which seemed difficult of

understanding. In closing what was considered an unusually profitable discussion of his subject Mr. King expressed the hope that the national association would soon be strong enough financially to employ a permanent secretary who could devote his entire time to a study of the needs of the building fraternity in legislation and could also serve as a field secretary, visiting the various cities and keeping the contractors well informed and active on matters vitally affecting their interests.

REPORT OF PLANS AND CONTRACTS COMMITTEE

A progress report of the Plans and Contracts committee was presented, this report dealing chiefly with a series of recommendations made by the New York Building Trades Employers Association. A portion of this report follows:

When the revised form of contract documents of the American Institute of Architects was published the representatives of this Association realized that in spite of the immense amount of work bestowed upon the document the careful scrutiny caused by putting it into actual use would show imperfections requiring further study and ultimate amendment. Many suggestions have been made looking to their improvement. The most important of these are the criticisms of the building trades employers of the city of New York. These criticisms were considered between representatives of that association and of the American Institute of Architects, and in general agreements were reached upon them. Some of them after full discussion were admitted to be unfounded. Others contained ideas which were embodied in language acceptable to both parties to the conference. Others are still under consideration, requiring a conference with the authorities of the institute or representatives of the surety companies.

In all cases in which the representatives of these two bodies have agreed upon an amendment to be made to the general conditions, your committee has accepted the result of their deliberation and believes that improvement will be made to the general conditions by amending them in accordance therewith. A number of subjects are included in the amendments so approved, among them being:

Express authority to the architect to make minor changes.
A provision that individual alterations to the general conditions shall be appended to the general form.
Permission to the contractor to remove the foreman for misconduct.
A stricter limitation to the power of the architect in regard to the re-examination of work.
The omission of responsibility on the part of the contractor for damage to adjacent property, except as provided by law.
Greater protection to the contractors where the drawings and specifications are at variance with local building laws.
Less universal liability for infringment of patent rights.
A better defined rule in regard to the condition of the work when finished.

Upon three subjects final agreement was not reached by the representatives of the two bodies in conference, and these should be further considered by this committee and by the counsel of the Association in conference with the representatives of the institute and the Building Trades Employers' Association. These are as follows:

1. The general question of liability for damage caused by the acts of the contractors, subcontractors, or workmen. On this subject it seems probable that a complete rewriting of three or four of the articles will result in a definition of responsibility which will be more accurate and equitable.

2. The question of the agency of the architect, particularly in relation to authority to order changes without the special written sanction of the owner. It appears that in New York City the architects are frequently made the agents of the owner for the purpose of ordering changes to any extent believed by them to be necessary. Elsewhere the rule seems generally to the contrary. Many of the architects are strongly opposd to assuming such unlimited responsibility. It will undoubtedly be greatly conducive to the promptness of building if the architects will be willing to consent to the granting of express power to the architect to direct changes at his discretion. The positive expression of the architects represented at the many conferences would seem to render it doubtful whether they will ever consider the position insisted upon by the New York Association and contended for by some members of the New York Chapter of the Institute. It is hoped, however, that some expression of the architect's power will be found which will be an acceptable compromise between the different builders.

3. The question of Mechanics Liens has always been recognized as one of the most difficult questions to settle in general conditions, largely owing to the fact that the lien laws of the different states are extremely varied. It is thought, however, that some general words may be found which will be acceptable in the general conditions, although in some states it doubtless will be necessary to use additional clauses appropriate to the laws of the state.

A joint meeting was held in Baltimore between representatives of the American Institute of Architects, this Association and several bonding companies, in October, 1916, at which the subject of bonds was very fully considered. This resulted from objections from the bonding companies to the broad terms of the bond prescribed by the institute as one of the standard documents. At that conference a resolution was adopted asking the institute to consider additions to the standard form bond limiting alterations to 20 per cent in excess of the contract price without containing the consent of the surety and forbidding any substantial change in the retained percentage to the detriment of the surety without its consent. It was also determined that the whole question of premium upon the bond should be considered by the surety companies with a view to their reduction if the concessions above outlined were made.

The Committee on Publicity in their report put a quietus upon the movement started a year ago to have an official publication or "organ," stating that the idea after investigation had been found not to be feasible.

A report of the Committee on Ethical Practice contained considerable subject matter as the result of the deliberations of a year or more, but these were not yet in shape for action by the convention. It was therefore decided to have the recommendations on this line printed and submitted to the various exchanges in the form of a tentative report to be definitely considered after expressions from the affiliated bodies with any additional suggestions that might be made.

WEDNESDAY AFTERNOON SESSION

An explanation of the Nelson form of selecting bidders and compensating contractors for time spent in making estimates was given in a paper by H. W. Nelson, of Moline, Ill., which was read by Secretary Scates in the inability of Mr. Nelson to attend the convention on account of illness. This plan was also explained to the secretaries' conference the account of which is to be found elsewhere.

ELECTION OF OFFICERS

The annual election of officers developed considerable rivalry for some of the minor positions but not for president, the new head of the association being chosen by unanimous vote without opposition.

These officers were selected for the ensuing year:

President.....R. K. Cochrane, of Pittsburgh.
First Vice-Pres...Ernest McCleary, of Detroit.
Second Vice-Pres..B. M. Freeman, of Columbus.
Treasurer..Charles W. Bernhardt, of Atlanta.

The newly elected president was escorted to the

platform and made a characteristic speech bringing the day's business to a close.

THURSDAY MORNING SESSION

An address on "Accident Prevention as Related to Building Contractors," by C. W. Price, featured the session of Thursday morning. Mr. Price, whose experience with the National Safety Council and formerly with the International Harvester Company well fitted him to discuss this subject, gave some very interesting information to the builders. He said that in talking with over 500 managers of industrial plants he had found that the conservation of the human element in industry was receiving increasing attention.

"It is coming to be axiomatic with business men," said he, "that unless they follow the plan of preserving the human element they are losing one of their greatest assets. The International Harvester Company, with 50,000 men employed, has reduced the number of men killed during the last five years by 61 per cent and the cost of compensation to injured workmen from 54 cents on each $100 payroll to 25 cents. They calculate a saving of 25 per cent as a dividend through economies thus made. Three-fourths of all our industrial accidents are preventable. Two-thirds of all that has been accomplished for improved methods has come through education. I strongly recommend the interesting of workmen in this subject and a liberal use of printed matter showing how to prevent accidents."

Following the address a motion was made that the incoming administration take up this general subject with a view to enlisting the aid of the national body in its consideration.

A pleasing incident of the session was the introduction of little Helen Carey, five-months old daughter of Dan Carey, secretary of the Atlanta Exchange, who was made a life member under title of "Daughter of the Convention."

RESOLUTIONS ADOPTED

On recommendation of the Committee on Resolutions the following resolution was adopted:

"Resolved, That this Association, adhering to the principle of home rule expressed in its constitution, is opposed to the sympathetic strike; to the cessation of work on account of jurisdictional disputes of labor organizations; to the limitation of individual output; and to all wasteful, uneconomic and inefficient methods which delay the progress of building and unnecessarily increase its cost without benefit to the public."

Among the other resolutions adopted was one in protest against the passage of the Excise Tax Bill by Congress; one approving the Atlantic Deeper Waterways movement; another that the president of the association refer to a proper committee the subject of providing uniform laws for penal bonds on state and municipal work; a resolution referring to all affiliated bodies for their careful study the Nelson form of selecting bidders and compensating them for their work; a resolution requesting the Committee on Ethical Practice to continue its labors and report at the next convention; a patriotic resolution offering all possible aid to President Wilson in carrying out his policy for the protection of American lives on land and sea; and a resolution establishing a permanent committee on legislation.

Resolutions of thanks recognizing the services of retiring President Trainor, Secretary Scates and members of the Board of Control were also adopted by rising votes.

In the afternoon the time was given over largely to the selection of the next convention city. Pittsburgh won out over Cincinnati by a vote of 413 to 253. The newly elected officers were formally presented, and the new Board of Control announced as follows: C. A. Dubel, Sioux City, Iowa; F. M. Harris, Jr., Philadelphia; C. J. Kelley, New York City; D. C. McCord, Dallas, Tex.; C. C. Pierson, Indianapolis, Ind.; J. P. Cullen, Janesville, Wis.; E. D. Tessier, Greensboro, N. C.; G. A. Richards, Grand Rapids, Mich.; O. W. Jovian, Chicago; I. H. Scates, Baltimore; R. K. Cochrane, Pittsburgh; E. McCleary, Detroit; B. M. Freeman, Columbus, Ohio; C. W. Bernhardt, Atlanta, Ga.; John Trainor, Baltimore.

The new president announced the appointment of E. M. Tate, secretary of the Builders' Exchange of Pittsburgh, as secretary of the National Association of Builders' Exchanges, for the ensuing year.

CONFERENCE OF SECRETARIES OF BUILDERS' EXCHANGES

A valuable and interesting preliminary to the convention of the National Association of Builders' Exchanges in Atlanta, Ga., was the annual Conference of Secretaries which was held on the day preceding the opening of the convention proper. Upwards of twenty of the active managers of live organizations in all parts of the country assembled for the conference, which was called to order by E. M. Tate, secretary of the Pittsburgh Builders' Exchange, who was elected presiding officer for the 1917 meeting at the previous session in Baltimore. A series of tables arranged in the form of a hollow square provided a convenient medium for a "get together" spirit, which added much to the success of the conference. The secretaries assembled at the Ansley Hotel at 10 o'clock on Monday, Feb. 12.

A wide range of topics characterized the conference, which had as its keynote the interchange of ideas of mutual benefit in the management of the associations of builders throughout the country. A feature of the meeting was an exhibit of printed matter brought to the convention by the various secretaries illustrating what had been done in this line by them during recent months in the way of publicity, membership roster, attractive notices for banquets, smokers, business gatherings, luncheons, etc. Some unique ideas were thus brought out and their merits discussed.

An address by C. P. Massard, secretary of the Master Builders' Association of Iowa, explaining the Nelson plan for selecting bidders and estimating on building work with results obtained by practical application of the plan in the city of Des Moines and three other cities now trying it, was listened to

with much interest. By this plan Mr. Massard said all persons figuring on a job are compensated for their time and energy.

At the noon recess the visiting secretaries were the guests of the Secretaries' Club of Atlanta for luncheon. True hospitality of the southern style was displayed at this social feature. Songs were sung and wit and humor held full sway under the leadership of Dan Carey, secretary of the Atlanta Builders' Exchange, and "Cousin" Fred Hauser, the convention-getter and entertainer of the city.

Greetings were extended to the guests by Walter Cooper, secretary of the Atlanta Chamber of Commerce, who emphasized the need of constructive work if organizations of business men in any line are to endure.

It was decided on motion of Samuel B. Donnelly, of New York, that at the next conference the secretaries come prepared to make reports on the new enterprises and undertakings of their exchanges in the twelve months which shall intervene, these reports to be made the basis of later discussion. By unanimous vote Mr. Donnelly was elected chairman of the next conference.

Not all of the secretaries who attended the National convention proper arrived in time for the preliminary session. Those in attendance were as follows:

Philip Williams, secretary Builders' Exchange of North Carolina.
Lee Parrish, secretary Builders' Exchange, Nashville, Tenn.
David Burnet, secretary Builders' & Traders' Exchange, Cincinnati, Ohio.
George L. Wadsworth, secretary Builders' Exchange, Norfolk, Va.
J. M. Hollaway, secretary Builders' Exchange, Montgomery, Ala.
Howard C. Faust, secretary Builders' Exchange, Reading, Pa.
John L. Snoddy, secretary Builders' Exchange, Chattanooga, Tenn.
Dan Carey, secretary Builders' Exchange, Atlanta, Ga.
Charles Elmer Smith, secretary Builders' Exchange, Philadelphia.
C. P. Massard, secretary Builders' Exchange, Des Moines, Iowa.
Ray Gould, secretary Master Builders' Association of Nebraska.
Frank N. Farrar, secretary Builders' Association Exchange, Buffalo, N. Y.
Paul A. Haskell, secretary Builders' Exchange, Omaha, Neb.
J. M. Vollmer, secretary Builders' Exchange, Louisville, Ky.
A. H. Shank, secretary Builders' Exchange, Grand Rapids, Mich.
E. M. Tate, secretary Builders' Exchange, Pittsburgh, Pa.
James B. Donnelly, secretary Building Trades Employers' Association, New York City.
I. H. Scates, secretary Builders' Exchange, Baltimore, Md.
John Hauck, secretary Builders' Exchange, Indianapolis, Ind.
Earl Constantine, field secretary National Council for Industrial Defense, New York.
Edward A. Roberts, secretary Builders' Exchange, Cleveland, Ohio.

TEACHING THE BUILDING TRADES IN MINNEAPOLIS

The fact that the supply of competent building mechanics is becoming increasingly unequal to the demand has caused many efforts to be made to ease the situation by the teaching of the building trades in training schools. In this connection it is interesting to note that a class for bricklayers' apprentices has been opened at Dunwoody Institute, Minneapolis, Minn. The class runs for two months in the dull season, five days a week, from 8.30 a. m. to 3.30 p. m. The features are given in the following statement by the institute:

"Half the school day is given to classroom work and half to practical work. The apprentice gets instruction through practice work in the things which he does not have a chance to learn on the job, such as the building of different bonds, arches and fireplaces. Particular attention is paid to the right methods of doing things, such as the laying of the mortar and the use of the trowel.

"In the class room work apprentices get instruction in plan reading, sketching, drawing, mathematics and technical information about the trade.

"Through the understanding with the trade the apprentice is paid one-half his usual wage in the trade for attending school. The apprentice gives the other half for his attendance without compensation.

"Money due from the employer to the apprentice for his attendance upon this class, is deposited with the authorities of the Dunwoody Institute and is to be paid to the apprentice when he closes his period of apprenticeship to the trade and becomes a journeyman. At the same time he will receive a diploma from the school for the course."

THE DEFINITION OF A KNOT

We are all so familiar with the thing called a knot, found in wood, that offhand it might seem silly to ask for a definition of the word knot, or an explanation of what the word means, says an exchange. It is a peculiar fact, however, that answering this question was quite a puzzle to a number of lumber association folks a time or two when they were forming grade rules, and lately that dignified organization known as the American Society for Testing Materials has been wrestling with the problem of defining a knot.

Briefly, a knot may be defined as a part of wood that differs in texture and nature of growth from normal. What is known as a sound knot is one which is just as solid or sound across its face as the wood surrounding it. An encased knot is one whose growth rings are not interwoven with the growth rings of the wood surrounding it; but if it is a sound or tight knot it will be held tightly by the encasing wood around it. A water-tight knot is one which is completely interwoven with the surrounding wood on at least one face of the lumber. A loose knot is one not held firmly in place by the surrounding wood. An unsound knot is one that is not as hard as the wood surrounding it, or one that has a hole in it.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS FOR JANUARY SHOW 8.8 PER CENT INCREASE OVER JANUARY, 1916

THERE are many interesting features in the building situation of the country as reflected in the reports from 112 cities which we present herewith. In some sections conditions seem to be somewhat abnormal due undoubtedly to peculiar local conditions, but regarded as a whole the outlook would seem encouraging. The total estimated cost for which permits were issued in the first month of the current year was somewhat in excess of January, 1916, the increase being represented by 8.8 per cent. It is quite fair, however, to assume that some considerable proportion of this is due to the increased cost of all materials entering into building construction and which have shown rather remarkable advances as compared with a year ago. Of the four sections into which we have divided the country, the only one showing a loss in the value of building improvements is found in the Middle States, while in the extreme West there is shown a phenomenal increase as compared with last year, due to the unusual activity in new building construction in Los Angeles, San Francisco, and Seattle.

From the eastern section of the country we have reports from 44 cities of which 24 show an increase and 20 a decrease as compared with January last year, the result being a gain of 2.6 per cent. The accompanying table affords an indication of the activities in the cities reporting:

CITIES OF EASTERN STATES

	January, 1917	January, 1916
Albany	$274,135	$114,595
Allentown	195,025	120,345
Altoona	21,093	4,982
Atlantic City	183,670	180,571
Auburn	14,900	3,600
Bayonne	70,613	125,683
Binghamton	145,693	75,700
Boston	4,174,751	2,585,093
Bridgeport	180,260	392,276
Brockton	37,505	50,950
Buffalo	285,000	510,000
East Orange	105,422	59,955
Elizabeth	56,630	455,088
Erie	194,380	116,171
Hartford	1,600,087	235,978
Haverhill	41,300	25,200
Hoboken	20,490	15,625
Irvington	14,235	39,015
Manchester	53,120	50,684
Newark	508,195	359,363
New Bedford	36,300	204,770
New Britain	40,790	89,760
New Haven	165,855	675,068
New York:		
Manhattan	5,915,005	5,710,019
Bronx	817,327	1,861,158
Brooklyn	2,346,907	3,012,343
Richmond	221,910	106,101
Niagara Falls	17,225	42,225
Nutley	16,035	8,643
Passaic	63,385	43,280
Paterson	88,382	141,788
Philadelphia	2,141,630	1,859,090
Pittsburgh	735,123	344,944
Quincy	81,365	79,875
Reading	24,025	11,750
Rochester	470,373	746,506
Schenectady	30,880	57,950
Springfield	320,430	325,815
Syracuse	165,240	219,715
Trenton	53,316	36,812
Troy	33,715	207,995
Utica	30,750	77,135
Worcester	201,538	269,185

Notwithstanding the fact that out of the 37 cities reporting from the Middle States, 25 show a gain and 12 a loss. The result is a decrease as compared with January last year of 3.24 per cent. This is due largely to the heavy shrinkage in operation in such cities as Chicago, Cleveland, Milwaukee, Minneapolis and St. Paul. Notable increases are found in Akron, Cincinnati, Detroit, Kansas City, Mo., Richmond, St. Louis, and Toledo.

CITIES OF MIDDLE STATES

	January, 1917	January, 1916
Akron	$568,785	$288,430
Canton	138,250	71,725
Cedar Rapids	48,000	67,000
Chicago	4,807,700	8,118,200
Cincinnati	609,105	445,895
Cleveland	1,389,240	1,600,895
Columbus	137,010	223,41!
Davenport	43,655	27,579
Dayton	233,104	115,645
Des Moines	242,967	115,645
Detroit	3,222,785	1,979,410
Duluth	96,065	113,733
East St. Louis	27,025	5,885
Evansville	94,255	31,862
Ft. Wayne	62,250	64,250
Grand Rapids	207,035	118,455
Indianapolis	376,995	342,910
Kansas City, Kans.	77,230	23,530
Kansas City, Mo.	756,950	444,575
Lincoln	24,855	53,045
Milwaukee	298,137	2,482,792
Minneapolis	263,485	586,340
Omaha	192,835	177,275
Peoria	107,280	116,900
Richmond	623,065	300,592
Saginaw	11,600	4,675
St. Joseph	85,708	10,990
St. Louis	2,286,844	644,191
St. Paul	313,680	423,198
Sioux City	135,200	42,200
South Bend	164,032	11,250
Springfield, Ill.	23,870	92,150
Superior	15,220	6,955
Terre Haute	34,395	22,535
Toledo	1,032,107	560,875
Topeka	32,175	29,110
Wichita, Kans.	206,605	34,800

In the Southern States the amount of new construction work for which permits were issued in January differed little from that of the same month in 1916, the difference being in favor of last month by 1.9 per cent.

CITIES IN SOUTHERN STATES

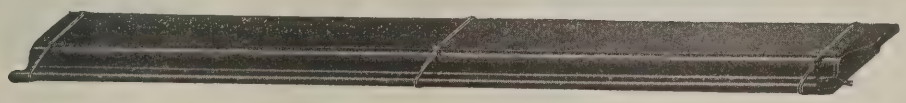
	January, 1917	January, 1916
Baltimore	$1,115,919	$948,210
Beaumont	103,806	103,784
Birmingham	123,515	273,611
Chattanooga	49,910	66,390
Dallas	607,477	771,630
El Paso	407,107	312,077
Ft. Worth	97,986	91,137
Jacksonville	66,012	123,790
Louisville	88,170	178,980
Memphis	268,850	186,800
Montgomery	9,460	57,399
New Orleans	127,939	146,909
Norfolk, Va.	122,542	148,222
Oklahoma City	137,340	103,350
Richmond	623,065	300,592
Savannah	49,340	51,930
Wilmington	208,861	263,768

As intimated at the beginning of these comments, the cities of the extreme West of which 15 have reported show the unusual increase over January, 1916, of 115.36 per cent. The table of figures presented herewith shows where the greatest activities occurred.

CITIES IN EXTREME WESTERN STATES

	January, 1917	January, 1916
Berkeley, Cal.	$140,950	$64,500
Colorado Springs	62,595	11,986
Denver	96,370	141,260
Los Angeles	4,709,235	1,678,724
Oakland	432,974	248,408
Pasadena	112,874	77,882
Pueblo	267,502	21,636
Salt Lake City	24,500	178,262
San Diego	107,128	128,554
San Francisco	1,622,472	947,551
San Jose	40,514	20,067
Seattle	500,225	236,040
Spokane	38,555	56,355
Stockton	83,910	18,222
Tacoma	78,751	33,154





PACKED READY TO SHIP

ON A MOMENT'S NOTICE

This advertisement was designed especially to show the building contractor how the Adjustable Storm-Proof Door Hanger No. "88" is packed ready for shipment, one pair in a box, with bolts for attaching the hangers to the door; also lag-screws and end-caps for the rail. Each box contains also a set of illustrated directions for attaching the hangers and rail.

Socket wrenches for lag-screws and bolts are also furnished, one with every two pair of hangers.

THE NATIONAL METHOD OF PACKING GOODS

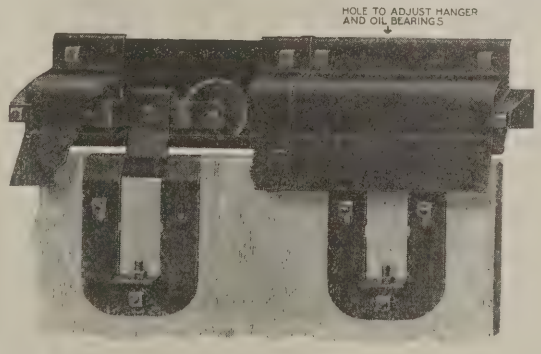
makes it easy for you to put them up and saves time and prevents loss of bolts and screws.

The accompanying illustration shows the method used for packing our Storm-Proof Rail. This method of packing has proved so popular with our customers that it deserves special mention.

The corners and edges are fully protected and cannot get bent in shipping or handling. The rail reaches destination in perfect condition.

ADJUSTABLE STORM-PROOF DOOR HANGER No. 88

Made from heavy-gauge steel with great carrying capacity. It is perfect running and its flexible hinge-joint allows the door to swing out if bumped, while hanging free from vibration ordinarily.



With this hanger should be used our Storm-Proof Rail, fitting close to the building, bird-proof, requiring no brackets and fully protecting the space between the door and rail-bottom.

National Manufacturing Company

STERLING, ILLINOIS

Asphalt Shingles

"The Roof that Stays Young"



CONTRACTORS and Builders find in *Asphalt Shingles* the kind of roofing that gives 100% *plus* of service to the house owner, with a beauty that strikingly enhances the house. And this at a price no greater than a common roofing.

Within the same cost estimate you can specify or use *Asphalt Shingles* and have a roofing that will *stay young* and that will not crack, lose its beautiful coloring, or warp. One of its handsome colors would harmonize artistically with the shade of the other building materials you use.

Our National Advertising Helps You

We are making the home building public still better acquainted with Asphalt Shingles through broad, national publicity. This helps you. You can work in harmony with it to give your customers greater value for every roofing dollar they spend. You can give them a roofing that will put additional tone into the outside appearance of the house without a cent of extra expense.

In all of our advertising we always refer the house owner to his Contractor, Builder or Dealer regarding Asphalt Shingles.

Asphalt Shingle Publicity Bureau, 954 Marquette Building, Chicago

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

New Models of "The Standard" Low Charging Mixer

In order to more fully meet the requirements of builders doing small jobs of concrete work some new models of "The Standard" low-charging mixer have

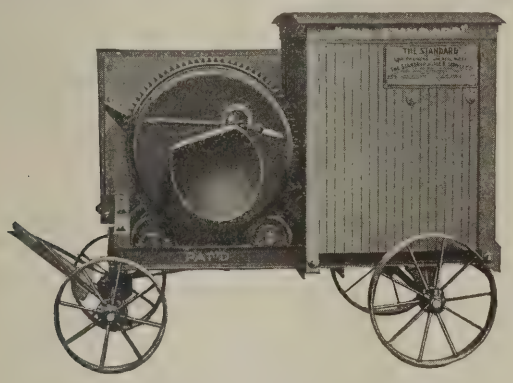


Fig. 1—General View of the New Design

been brought out for the season of 1917. These models in the regular side-loading machines are the same in general design as those which have been built for several years, but minor changes have been incorporated where it was found possible to further develop and improve the important features which characterize this mixer. As now turned out by the Standard Scale & Supply Co., 1345 Wabash Ave., Chicago, Ill., all machines are furnished with the folding platform, which, with the open drum and patent low charging intake blade arrangement, are features which have proven very popular. On account of the simplicity of construction and the small amount of power required to operate the mixer, a gasoline engine drive has always met with much favor. The horse-power of the engine furnished is usually more than double that actually needed, but this surplus power has been found to be a very important feature in securing successful con-

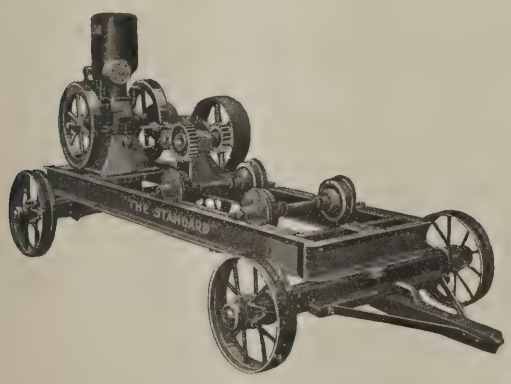


Fig. 2—View of the Engine Mounted on Truck

tinuous operation. One of the features of the Standard machine which has been developed to a high degree of efficiency is the belt transmission between the engine and the mixer and the floating idler used on this belt. The claim is made that this transmission prevents all jar from the mixer being carried back to the engine and also provides for starting the engine or stopping the mixer independently. The simplicity of the gasoline-engine outfits is said to be greatly enhanced by the new single-pedestal, twin-bearing box, which was first used last year and which has proved of great advantage, since it avoids the difficulties of holding rotating shafts in separate bearing boxes on portable outfits where the trucks are liable to be out of level or askew, with consequent pinching on the shafting. The use of sprockets and chains on the smaller sizes of mixers has been abandoned in the new 1917 models. This has been done to secure greater simplicity of design, for it has been found that the new belt drive combines higher efficiency with greater simplicity of construction. In the general design of truck-mounted outfits the trucks have been shortened, and on some sizes the folding platform has been made larger. The new small-size machines are made short and compact, thus adding greatly to their portability. The use of wood houses is retained on a majority of the sizes. In Fig. 1 is shown the truck complete with mountings and twin bearing box, and at

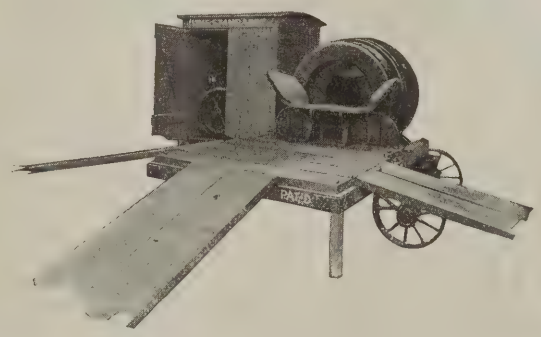


Fig. 3—The Mixer with Platforms in Position

the same time illustrates the simplicity of the new designs. Fig. 2 shows the engine mounted on the truck, while Fig. 3 represents the mixer with the platforms in position. In addition to the new models in low charging side discharge machines a new 1917 model of the Standard street paver with skip loader and with either distributing boom and bucket or discharge spout has been placed on the market. This machine combines many unique features, including a distribution of the parts so that the weight is balanced on the four wheels.

Making Cornell Wood-Board

The user of Cornell Wood-Board made at Cornell, Wis., may be interested in learning something about the details of its manufacture, and we therefore present some particulars gleaned from a booklet just sent out by the makers of the board in question: The logs are felled and taken to the mill, where they are cut into short lengths which are carried to the "barkers" on special conveyors, and here all the bark is stripped off. Next the logs go to the "grinders," where they

are shredded into fibers by machines directly connected to water wheels. The fibers are then "screened" to remove knots, pieces of bark, or similar defects. Next comes the Cornell process of moisture-proofing each individual fiber, the fibers being placed in vats and thoroughly soaked with the special moisture-proofing compound. Then the mass is carried along to machines where it is formed into sheets and passed over "dryers" to remove the moisture. These sheets are then cemented together to form solid boards, which are cut into the standard sizes. The final step in the process is another careful moisture-proofing of the boards, both back and front. More interesting information concerning this product of the Cornell Wood Products Company, 173 West Jackson Boulevard, Chicago, Ill., is contained in a booklet entitled "Better Building" and obtainable by addressing Dept. T-2. The booklet is handsomely illustrated in colors, thus giving an excellent idea of how the product looks when colored and applied, for the illustrations consist of attractive interiors of dainty color scheme.

A Steel Framed Cellar Window

One of the latest candidates for popular favor in the way of cellar window construction is that which has just been brought to the attention of the trade by Shrauger & Johnson, Atlantic, Ia. It is known as the "Chief Everlasting Cellar Window," and is made of No. 20 galvanized steel. No wood whatever is used either in connection with the window or its casing and no putty to hold the glass in place. The view presented in Fig. 4 shows the outside of the window and clearly indicates just how it fits into the foundation wall of the building. There is a large flange at the back of the casing which fits securely against the inside of the wall, thus preventing any outward slipping. The

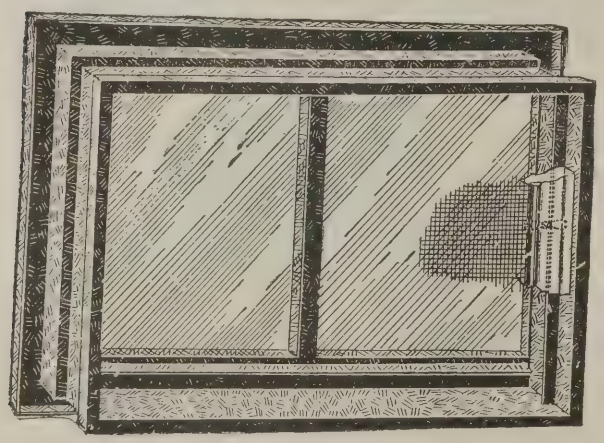


Fig. 4—The "Chief" Steel Framed Cellar Window

angles at the sides, top and bottom are filled with mortar, thus making a construction that is tight and durable. The strip running vertically along each side of the casing affords a strong support for the screen to which it is fastened and at the same time allows the screen to be easily and quickly put in place or removed. Another feature of this window is a little steel lip running entirely across just below the bottom edge of the glass and supporting the latter. It projects just far enough to prevent any water from getting inside but causes it to run off the casing which slopes outward. The construction is such as to prevent the cellar window from leaking. The manufacturers have issued some interesting literature relating to this window and to other products they are prepared to supply.

The Certain-Teed Products Corporation

Announcement has recently been made by the president of the General Roofing Manufacturing Company, St. Louis, Mo., that a new concern has just been organized to be known as the Certain-teed Products Corporation. This is in reality an expansion of the General Roofing Manufacturing Company, the scope of the business having been enlarged by purchase of the Mound City Paint & Color Company, the Gregg Varnish Company, both of St. Louis and the mill of the Lockport Paper Company at Niagara Falls. The present mills at East St. Louis and Marseilles, Ill., York, Pa., and Richmond, Cal., the latter being about twelve miles from San Francisco, are to be enlarged and improved as will also the paper mill at Niagara Falls. Adjoining the latter will be built a roofing factory.

In addition to the expansion of the roofing business, the new company will aggressively enter the paint and varnish field and it was for the purpose of forming the nucleus of an extensive paint and varnish business that the Mound City Paint & Varnish Company and the Gregg Varnish Company were purchased. The president of the new company is George M. Brown, the vice-presidents are Smith E. Allison, of New York, Audenried Whittenmore, of Chicago, and J. S. Porter and J. F. Schlafly, of St. Louis. The secretary and treasurer is J. C. Collins, of St. Louis. Clinton Brown will be assistant secretary and treasurer. These were all former officials of the General Roofing Company.

Meeting Mail-Order Competition

In many towns mail-order houses are securing a good deal of business which might well be obtained by the local dealer in building materials. In a circular issued by the Morgan Sash & Door Company, Dept. A-21, Chicago, Ill., it is stated that the advertising manager of a large mail-order house, at a convention of advertising men, said that his house maintains a bureau to read papers from all over the country, noting the towns where the merchants are not advertising steadily. These towns are then flooded with advertising matter, and the results in such places are claimed to be much greater than in towns where the merchants secure constant publicity. The Morgan Sash & Door Company states that the only way for the local dealer to fight mail-order competition is by a utilization of the same weapon employed by the mail-order house, namely publicity. The company is prepared to furnish the local dealer with literature and electrotypes to aid him in his publicity work, and show him just where and how he may get the business.

The High Cost of Building

The extremely high cost of structural steel has caused many of those contemplating construction work in the way of factories and similar buildings to make use of either reinforced concrete or of what is known as "Slow-burning mill construction." In a personal letter to a fellow manufacturer in Cleveland, I. T. Kahn, president of the Duplex Hanger Company of that city, gives his opinion on the relative cost of the two types. He refers to the high cost of structural steel and gives various reasons for the present relative cheapness of the slow-burning mill type compared with reinforced concrete. He points out that the insurance rates are practically the same for either type where a sprinkler system is installed, and emphasizes the fact that many architects are likely to design the cheaper type of construction; that when the demand for the materials required reaches the market, a considerable advance in the price of heavy timber will ensue, this advance being probable about May or June. Mr. Kahn is also president of the Republic Structural Iron Works Company, and of the Columbian Hardware Company, both of Cleveland, Ohio, and considering his connections, the comments are valuable and likely to prove of interest to architects and builders who wish to anticipate any advance in the cost of lumber.

(Continued on Page 22 of the Advertising Section)



"The Roofing Development of the Twentieth Century"

"I took my town by storm

—when I became known as the Neponset Carpenter. My first roof of Neponset Twin Shingles put me 'in right' with all the property owners in my community. I wasn't told directly, but I knew I had made a big hit. I wasn't surprised, because I can't understand a person who wouldn't want his home roofed with these beautiful



The Neponset Carpenter

NEPONSET TWIN SHINGLES

(Patent applied for)

"Some folks call them 'The Roofing Development of the Twentieth Century'—and that expression just about fills the bill.

"You see, Neponset Twin Shingles have earned the right to this title through sheer merit. They are beautiful to look at—their red and green colors harmonize with any surroundings or architectural plan. Five layers, six processes guarantee longest wear to these shingles. Their twin shape halves cost of laying—25% less nails required. Approved by the National Board of Fire Underwriters. There are three types of Neponset Shingles for every requirement and pocket-book. Also other Neponset Building Products that are mighty popular.

"Here's the coupon I mailed. Mail it today—and get started in a profitable business."

BIRD & SON (Established 1795) **Dept. B, East Walpole, Mass.**

New York Washington Chicago Canadian Office and Plant: Hamilton, Ont.

BIRD NEPONSET PRODUCTS

Look for this trademark on all Shingles, Roll Roofings, Wall Boards and Building Papers. There is one meeting every requirement and purse—all guaranteed by us.

BIRD & SON, Dept. B, East Walpole, Mass.

Please send me information about Neponset Twin Shingles and the other Neponset Building Products. Also a copy of your book, "Repairing and Building." This request does not obligate me in any way.

Name .....

Address .....

Good Varnish

We wish that you had greater incentive and encouragement to do fine varnish work—that your customers were more intent upon quality, durability and low final costs—less intent upon lowest bids.

In our advertising to the public we call attention to varnish of quality and long life in order that your customers may appreciate your recommendation of good varnish and good workmanship and pay for them.

Murphy Varnish

"the varnish that lasts longest"

can be depended upon to give the fine durable finish that you know wood ought to have. It costs you no more than poor varnish because it goes farther. It flows more easily. It rubs better. It saves labor.

Our principal house-finishing products are:

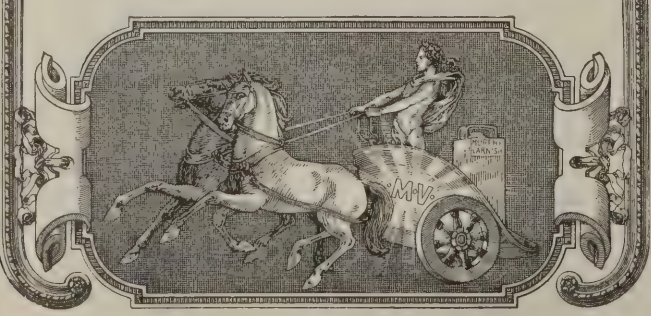
Murphy Transparent Interior Varnish
Murphy Transparent Floor Varnish
Murphy Transparent Exterior Varnish
Murphy Nogloss Interior Varnish
Murphy Semi-Gloss Interior Varnish
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

Send for more information.

Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois



(Continued from Page 174 of the Editorial Section)

Standard Stained Shingle Co. Change of Name

The Standard Stained Shingle Company has for nine years enjoyed a steady growth, but it has now been deemed desirable to continue under a name which will link its trade mark and corporate name together, and one which will permit the company to grow as the requirements of its field demand. Therefore the decision has been made to change the name to The Creo-Dipt Company, Inc., with general offices as heretofore at 1030 Oliver Street, No. Tonawanda, N. Y. Nothing but stained shingles and shingle stains will be manufactured, and it is stated that the company is not interested directly or indirectly in any other enterprise.

Fire Underwriters Approve "Unit" Sash Balance

We are advised by the Pullman Mfg. Company, Rochester, N. Y., that the Board of Fire Underwriters of Chicago has approved its "Unit" sash balance, and these goods may be used in fireproof buildings. The company states that this is the first sash balance that has been approved by the Board of Fire Underwriters and it is regarded as a most important point for the trade to know. The company has just issued a report of tests made by the Underwriters' Laboratories and containing much valuable information regarding the practicability and efficiency of the device as a substitute for pulleys, chains and weights. The report starts off with a general description of the product and describes the tests and their satisfactory termination, the matter being illustrated by blueprint pages inserted at intervals through the volume. The report states that the parts of the contrivance are well designed to serve the purpose for which they are intended, clearly indicating that strength and wearing qualities were noticeable features.

The "Myers" Wire Wall Tie

One of the latest candidates for popular favor in the way of a wall tie for double brick work is that which is being introduced to the attention of builders by the Mercer Manufacturing Company, successors to

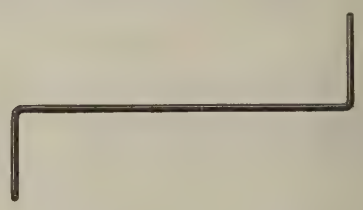


Fig. 5—The Myers' Wire Wall Tie

the John W. Bell Company, Mercer, Pa. This tie is known as the "Myers," is made of heavy galvanized wire and is furnished in 6 in. and 8 in. lengths. The tie is of such a nature as to have a positive bond and to thoroughly hold the two parts of the brick work together. In Fig. 5 we show the tie and the relative proportion of its length which is bent at each end. We understand that the company will be glad to send a sample of the tie to any architect or builder who may be sufficiently interested to make application for it.

The New Heppes-Nelson Roofing Company

The members of the building trades will be interested in learning of the recent incorporation of the Heppes-Nelson Company of Chicago, Minneapolis, and New Jersey. The Nelson Company has been in business in

(*Continued on page 26*)

GIVES IMMEDIATE DELIVERY

List of Distributors—Machines Ready for Shipment

Akron, Ohio
W. E. Wright Co.
995 E. Market St.

Baltimore, Md.
Aumen Machinery Co.,
107 E. Lombard St.

Billings, Mont.
G. M. Fletcher & Co.

Birmingham, Ala.
Carolina Portland Cement Co
Avenue A at Sixteenth St.

Buffalo, N. Y.
Hendee-Conner Co., 60 Pearl St.

Butte, Mont.
W. J. Walsh, 1345 Harrison St.

Charleston, S. C.
Carolina Portland Cement Co.

Charlotte, N. C.
Charlotte Supply Co.

Chicago, Ill.
H. F. & H. B. Hayden,
20 E. Jackson Blvd.

Cincinnati, Ohio
The J. M. Wikel Engineering Co.,
629 Union Trust Bldg.

Corry, Pa.
Corry Bridge & Supply Co.

Dallas, Texas
Pierre L. Russell, Inc.

Des Moines, Iowa
Globe Machinery & Supply Co.

El Paso, Texas
Sheehan-Hackley & Co., P. O. Box 967.

Evansville, Ind.
Indiana Builders Supply Co.

Ft. Wayne, Ind.
Ft. Wayne Builders Supply Co.,
812-840 Hayden St.

Indianapolis, Ind.
Van Camp Hdwe. Co

Joplin, Mo.
McNeal Machinery Co.

Kansas City, Mo.
Builders Material Supply Co.,
Republic Bldg.

Knoxville, Tenn.
R. L. Harris, Holston Bank Bldg.

Leavenworth, Kans.
The Missouri Valley Bridge & Iron Co

Lincoln, Nebr.
National Supply Co.,
105-6 Bankers Life Bldg.

Los Angeles, Cal.
Herringbone Metal Lath Co.,
447-449 E. 3rd St.

Mattoon, Ill.
Breese Mfg. Co.

Memphis, Tenn.
Pidgeon-Thomas Iron Co.

Milwaukee, Wis.
H. F. & H. B. Hayden, 753 40th St.

Minneapolis, Minn.
Minneapolis Equipment Co.,
801 Plymouth Bldg.

Montreal, Canada
Watson Jack & Co., Ltd., Power Bldg

New Orleans, La.
Woodward, Wight & Co., Ltd.

New York City
Northwestern Steel & Iron Works,
Export Dept.
2635 Grand Central Terminal.

Norfolk, Va.
G. S. Friebus, 302 Monticello Arcade.

Omaha, Nebr.
The G. H. Alwine Co., 412 Ware Block.

Peoria, Ill.
Peoria Fuel Co.

Philadelphia, Pa.
Frank Toomey, Inc., 127-131 N. 3rd St

Pittsburgh, Pa.
Somers, Fitler & Todd Co.,
323-325-327 Water St.

Pocatello, Idaho
Pocatello Engineering & Machinery Co.,
129 S. Main St.

Portland, Ore.
Henry A. Conner, 26 N. Front St.

Raleigh, N. C.
William Walker Jones, 510 Tucker Bldg.

Richmond, Va.
(See Norfolk)

Saginaw, Mich.
Sullivan Supply Co.,
Cor. Genesee & Water.

St. Louis, Mo.
K. S. Axtater Co., 1506 Chemical Bldg.

San Antonio, Texas
San Antonio Machine & Supply Co.

San Francisco, Cal.
Continental Steel & Supply Co.,
527 Howard St.

Savannah, Ga.
Savannah Supply Co

Seattle, Wash.
Polson Implement Co.

Somerville, Mass.
Massachusetts Steel Products Co.,
438 Broadway.

Spokane, Wash.
General Machinery Co., First & Stevens

Springfield, Ohio
T. J. Lane, 241 Bushnell Bldg.

Toledo, Ohio
Moriarty Bros.
216-224 Ottawa St. (Oliver Bldg.)

Wilmington, N. C.
Hyman Supply Co.

The NON-SLOP "NORTHWESTERN" has had wonderful sale because giving wonderful value. Quick mixing action. Won't slop with regular charge. Trouble-Proof, Fool-Proof, Frost-Proof, and No Delay. MORE POWER than other mixers of same capacity.

NATION-WIDE DISTRIBUTION shown here places "NORTHWESTERN" MIXERS ready for delivery on shortest notice AT YOUR SERVICE.

Write to FACTORY for Bulletin No. 5, or ask one of our DISTRIBUTORS because

OUR PRICES ARE LOWEST OUR SERVICE IS BEST

NORTHWESTERN STEEL & IRON WORKS

"The House Of Good Service"

Capital Stock $200,000.00

EAU CLAIRE, WIS.

Please quote BUILDING AGE when writing to advertisers



the Northwest for more than ten years past and operates extensive felt mills, the benefit of which will accrue to the new concern. There is also being constructed one of the largest felt mills in the country and this we understand will house a very large felt machine by means of which sheets 130 in. wide can be produced. The management of the two properties remains the same as heretofore, but by means of the merging of their interests, very positive economies are expected to be effected which will prove an important factor in their roofing business. In bringing about this combination, a most important part was taken by O. A. Heppes and the story of his rise as a bright young roofing salesman to an outstanding position, first as the executive head of the Heppes Company and later as the directing genius behind the new Heppes-Nelson Roofing Company is only another illustration of what may be accomplished by persistent and well directed effort on the part of those determined to succeed.

Fiberlic Wood Grain Panels

Many of our readers are likely to be interested in an attractively printed booklet in which are set forth the merits of Fiberlic wood grain panels now being introduced to the attention of architects, builders and house owners by the MacAndrews & Forbes Company, 200 Fifth Avenue, New York City. These panels are said to meet the requirements of the popular demand for wood panels for all interior wall and ceiling surfaces and are fully protected by patents. The raw material from which the wood grain panels are made is the fiber from the licorice root, this fiber being very long and tough. It is treated by recognized and standard chemical process which eliminates the resinous matter and it is then by various steps rebuilt into thicknesses as required. These panels lend themselves to a vast number of finishes while the variation in grain available by the process by which the panels are produced is said to eliminate repetition. The color scheme of a room can be followed very accurately from the fact that the material so lends itself to the various stains that any wood effect may be produced. These panels are said to entirely eliminate splitting or cracking as in the case of solid wood panels, and lifting and checking as in the case of veneered or laminated panels. The panels are made in standard sizes of 24 in. and 32 in. widths and in lengths up to 12 ft. After the design of paneling is determined, and the studs or furrings placed accordingly, the wood grain panels are nailed in the usual manner and fastened tight with broad head nails placed about 3 in. apart. In using the panels over plastered walls or ceilings the furring strips may be placed directly over the old plaster and then the panels nailed to them. The manufacturers point out that before the wood mouldings are applied the panels should be finished according to their printed instructions on this point. The booklet in question contains many interesting suggestions as to the application and treatment of the panels and we understand that a copy of it will be sent to any reader of THE BUILDING AGE who may make application for it.

"Desco" Metal Store Front Construction

The Detroit Show Case Company, 483 West Fort Street, Detroit, Mich., calls attention to the fact that it has just brought out a new product in the way of metal store front construction and known under the name "Desco." This is referred to as distinctive and of even greater simplicity than its previous construction and by taking advantage of that development as well as of the development of the Parker Rust-Proof Process, the company is able to reduce the cost of production and therefore the selling price. The statement is made that all glass bearing members are of solid copper reinforced by rust-proofed steel sections. The

(*Continued on page* 28)

ANNOUNCING A NEW STORE FRONT

NEW PRODUCT— OLD COMPANY

FOR twenty-eight years we have constantly served Architects, Builders and Owners of Store Fronts. In every nook and corner of this country are concrete examples of the high quality of our products—and we believe this announcement of "Desco" metal Store Front construction will herald genuine interest in building circles. It is distinctive of even greater simplicity than our previous constructions and by taking advantage of that development and the development of the Parker Rust-Proof Process we are able to cut the cost of production, therefore the selling price. All glass-bearing members of Corner and Division Cars are of solid copper, reinforced by rust-proofed steel sections.

Desco METAL STORE FRONTS

Moderate in Price

"Desco" is not sold on a price basis, but on account of its simplified construction it is sold for less than you've been accustomed to pay. It is sturdy, permanent, safe, easy to install, and actually protects the glass.

Big Field for Store Fronts



1917 is the big Store Front year. "Desco" will enable you to make the greatest profit as the builder of modern Store Fronts in your city. It's easy to order, easy to sell and easy to install.

Send this coupon today for particulars of our co-operative plan. We have no salaried salesmen—we sell through contractors. Send coupon today and prepare to make this your most profitable year.

Send in this Coupon today

TEAR OFF

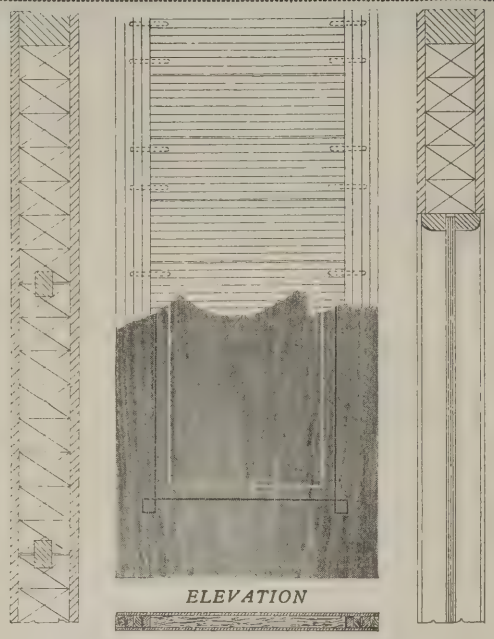
Detroit Show Case Co., 483 West Fort St., Detroit, Michigan.
Send particulars of "Desco" co-operative plan and description of the construction without obligation.

Name .....

Street .....

City .....

DETROIT SHOW CASE CO.
483 West Fort Street, Detroit, Michigan
(Makers of the well-known Petz construction)



We take pleasure in calling your attention to the construction of our "No Warp" Sanitary Doors, as illustrated above. They are made in the best manner, having cores formed of thoroughly seasoned laminated Chestnut stiles and rails, cross-framed and doweled together, and covered with 1-8 inch face veneers, and WILL NOT WARP OR TWIST.

We recommend them in all cases where sanitary doors are desired, and guarantee them for one year against defects due to the use of improper material or defective workmanship.

Manufactured by

HYDE-MURPHY COMPANY, Ridgway, Pa.

New York Office, 10 East 43d St.

Pittsburgh Office, Liberty Bank Bldg.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.

Owned and Operated by Nicholson File Company

construction is said to be easy to install and actually protects the glass. Builders throughout the country cannot fail to be interested in what the company has to say in regard to the merits of "Desco" and the profits which they can command in installing modern store fronts in the cities in which they are located. The company has a co-operative plan, the details of which will be furnished on application to the address given.

The New Stanley Wrought Steel Butt

A new wrought steel raised panel surface butt which the Stanley Works, New Britain, Conn., have just placed on the market is illustrated in general view in Fig. 6. The raised panel of the butt, which is known as No. 162, matches the popular Colonial patterns in lock sets and escutcheons. The design is strong, simple and dignified and is in pleasing harmony with the modern taste in architecture and builders' hardware. The lights and shadows on the surface of the panel give it the appearance of being finished

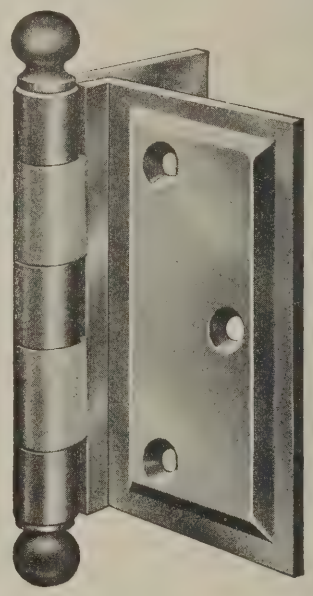


Fig. 6—The New Stanley Wrought Steel Butt

in two different shades or tones and is referred to as being the same "two-tone" effect which is produced on the latest builders' hardware. The point is made that a door may be easily and quickly hung with this hinge and the under tip is slotted to that the pin may be quickly reversed. The butt is obtainable in all the standard Stanley finishes and is furnished in three sizes, namely, 3 in., 3½ in. and 4 in.

The Bishopric Manufacturing Company

Architects and builders throughout the country will be interested in learning that the Mastic Wall Board & Roofing Company of Cincinnati, Ohio, has changed its name to the Bishopric Manufacturing Company and under this name the business will be conducted.

New Building for the Federal Motor Truck Company

While manufacturing facilities of the Federal Motor Truck Company, Detroit, Mich., have been doubled during 1916, plans are already under way to construct another large assembling plant in order that production may be further augmented during the ensuing year. Vice-President and General Manager M. L. Polcher expresses the opinion that the new addition

(*Continued on page 30*)



Anxious Property Owner:

"Chief, is my roof in serious danger from flying embers?"

Confident Fire Chief:

"Not if it is covered with RU-BER-OID—*Real* Ru-ber-oid. Many times it has proven itself to be thoroughly spark-proof."

Roof *your* buildings with RU-BER-OID. No building covered with RU-BER-OID is liable to catch fire from sparks.

RU-BER-OID meets with the approval of the Fire Underwriters' Laboratories.

RU-BER-OID can not rust, rot, warp, curl, crack, split or melt.

For more than 20 years it has protected roofs of all kinds. Many of them have never cost a penny for repairs.

Real RU-BER-OID has the Ru-ber-oid Man on every roll. He's a guarantee of long wear.



TRADE MARK REG. U.S. PAT. OFF.

BUILDING SUGGESTIONS

Any books you check on this list will be sent you free. Write your name and address in the margin and state what kind of building you are planning.

- ☐ Roofing a Home
- ☐ Building a Poultry House
- ☐ Building a Bungalow
- ☐ Building a Barn
- ☐ Building Your Own Garage
- ☐ Covering Your Factory
- ☐ Artistic Roofs
- ☐ Waterproof Cellars and Stucco



RU-BER-OID SHINGLES

are made in Slate Gray and Tile Red. They are laid just like wood shingles and give the architectural effect of slate or tile at a much lower cost.



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588 Woolworth Building, New York

BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete

The Paraffine Paint Co., San Francisco (Under License)
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Pronounced "RU" as in RUBY

RU-BER-OID ROOFING

COSTS MORE - WEARS LONGER

MADE BY THE STANDARD PAINT COMPANY, NEW YORK, BOSTON, CHICAGO

LOOK FOR THE "RU-BER-OID MAN" ON EVERY ROLL OF GENUINE RU-BER-OID



Fiberlic Wall Board

Fiberlic Wood Grain Panels

The material from which it is made is in itself a guarantee of the superiority of FIBERLIC for strong, permanent and economical construction.

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

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This Book

shows over 1500 Good Tools for all trades, including a great many handy tools for Carpenters. Every carpenter who wants to keep posted on the newest tools and improvements should write for a copy at once.

This book will be issued late in March. Write now in order to secure a copy as soon as they are out.

GOODELL-PRATT COMPANY
Toolsmiths
GREENFIELD
MASS., U.S.A.

will be sufficient for some time and ground will be broken early so that the structure may be completed in the spring. An interesting feature in connection with the product of this concern is that, according to Mr. Polcher, 62 per cent of all sales of Federal trucks are made to manufacturers, jobbers, farmers and business men who already own Federal trucks—in other words almost two-thirds of the Federal orders are repeat orders.

The Advantages of a Small Concrete Mixer

The foundations of the average dwelling house or of the comparatively small business structure are ofttimes a source of more or less annoyance to the contractor, and he is apt to feel that his requirements are hardly sufficient to justify the purchase of a mixer, while large

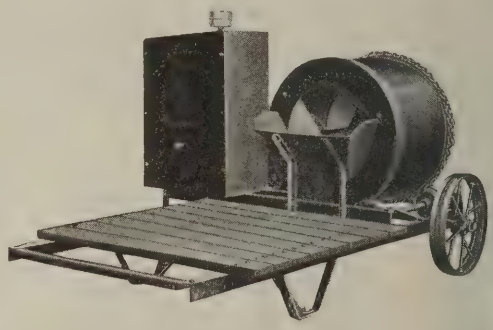


Fig. 7—The Two-Wheel Ideal Cincinnatus Concrete Mixer

contractors who often run into a small job do not feel it worth while to haul their large machine to the site of such a job and put it into operation where there is so little concrete to be poured. This condition of affairs has created a demand for small mixers which the Ideal Concrete Machinery Company, 1310 Monmouth Avenue, Cincinnati, Ohio, has met by bringing out the Ideal Cincinnatus No. 5 batchmixer made both as a two-wheel outfit with loading platform built on as shown in Fig. 7, and as a four-wheel outfit as shown in Fig. 8. The capacity of this mixer is said to be 5 cu. ft., dry materials, which requires just one-half sack of cement to the batch. This is a good size for handling small work, for while the machine will mix 45 to 50 cu. yds. of concrete in an ordinary day's run—far more than is required for the average foundation job—still it is small enough and light enough to be conveniently handled and therefore readily moved from one job to another. In fact, the makers state it is easily placed up on the "forms" so that the concrete may be discharged directly

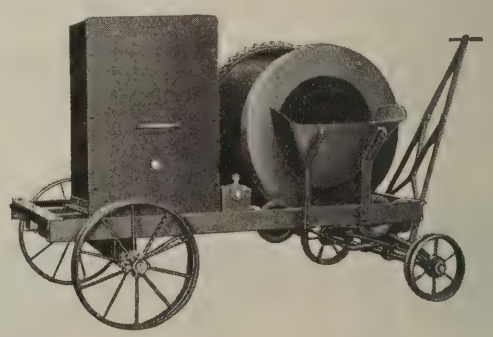
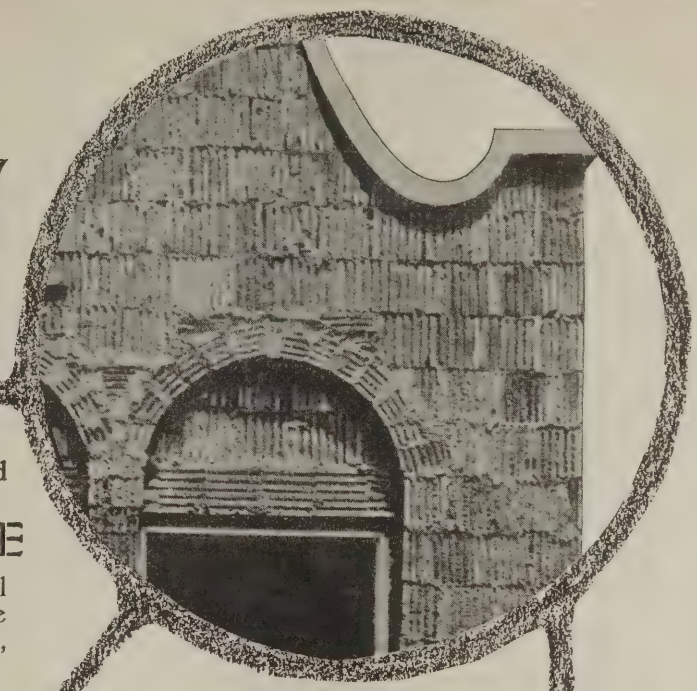


Fig. 8—The Four-Wheel Ideal Cincinnatus Mixer

into the wall without any wheeling or shoveling. The two-wheel outfit is especially adapted for handling foundation work or similar jobs. The reason for this is its large loading platform, which has been built on so that the materials may be wheeled directly on to the platform and discharged into the mixer from the wheelbarrows. The platform is large enough to permit a man with a wheelbarrow to turn around on it or to accommo-

(*Continued on page* 32)

FLEXIBILITY



in construction is an unexcelled feature of

NATCO·HOLLOW·TILE

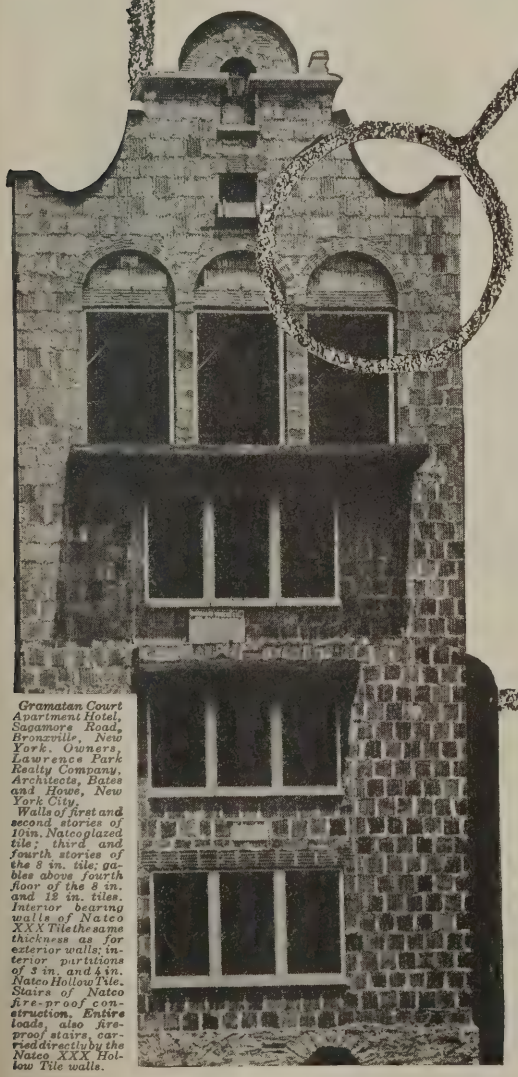
The fact that it can be built into all kinds of arches and angles (aside from its well-known weatherproof, fireproof and vermin proof qualities) has taken a prominent part in placing NATCO in the front ranks as a superior building material.

Many special shapes, corners, jambs, sills, and fractional pieces are ready-made for the builder's use.

The ease, grace and economy with which NATCO Hollow Tile lends itself to almost any conceivable form of fireproof construction is well represented in this four-story apartment.

Ask your Local Dealer in building materials about NATCO prices, deliveries, and service.

If you do not have our BUILDERS HANDBOOK, mail the coupon today and get *your* copy.



Gramatan Court Apartment Hotel, Sagamore Road, Bronxville, New York. Owners, Lawrence Park Realty Company, Architects, Bates and Howe, New York City. Walls of first and second stories of 10in. Natcoglazed tile; third and fourth stories of the 8 in. tile; gables above fourth floor of the 8 in. and 12 in. tiles. Interior bearing walls of Natco XXX Tile the same thickness as for exterior walls; interior partitions of 2 in. and 4 in. Natco Hollow Tile. Stairs of Natco fire-proof construction. Entire loads, also fire-proof stairs, carried directly by the Natco XXX Hollow Tile walls.

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Other Offices: **New York Chicago Boston Detroit Philadelphia Washington Syracuse**

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NATIONAL FIRE PROOFING COMPANY OF CANADA, Ltd. Office at Toronto and Factory at Hamilton, Ontario, Canada

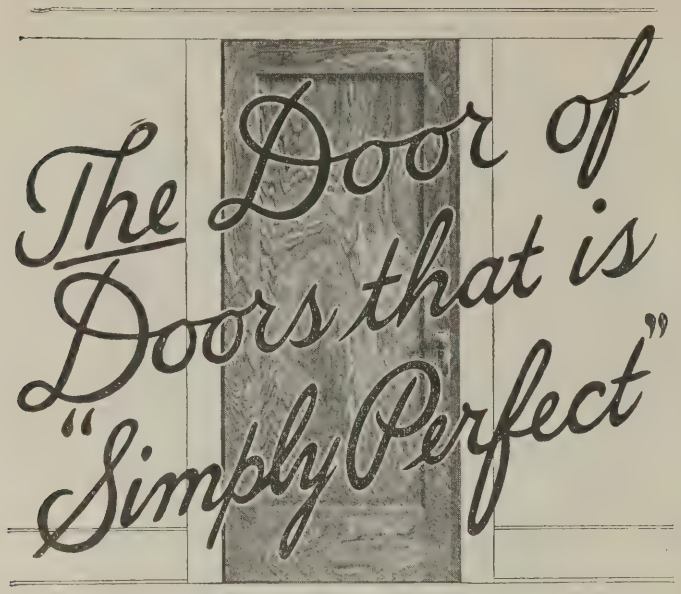
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Dear Sirs:—Please send me your BUILDERS HANDBOOK, free to engineers, architects and builders.

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Morgan *Advantages* are Beyond Competition

Wedge Dowel Construction—all White Pine Core—the wider choice of distinctive designs—the unmatchable range and the rare beauty of its veneers—have made the Morgan Line the favorite in the Field which it developed and now dominates.

To the Contractor Morgan Advantages are important because Morgan Quality and Morgan Service is *established*. Consequently whenever *you* specify MORGAN you specify a Door which, in the estimation of the homebuilder, "is simply perfect."

MORGAN DOORS

Are your kind—the kind you can *afford* to recommend

And they come to you under an Iron-Clad Guarantee that precludes "come-backs," "trouble" or dissatisfied customers."

Get the Morgan Mill Work Data Book

Familiarize yourself with the Morgan Family of Mill Products. It will pay you to know WHERE *your kind* of Doors can be had. Your dealer can supply you with all Morgan products without delay.

Morgan Sash & Door Company
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Exhibits of finished Morgan Model Doors in all principal cities. Ask for list.



Morgan Doors with their All-White Pine Cores, Wedge-Dowel Joints and Masterly Workmanship, are GUARANTEED not to swell, warp or shrink

date a water barrel or some sacks of cement. The two-wheel outfit is fitted with standard-gauge trucks and can be hauled behind the wagon over rough roads. This mixer, the company points out, is also coming into favor for larger jobs, owing to the fact that it is more economical in some instances to place these small mixers around on the job and mix the concrete at the spot where it is to be placed than it is to have a large mixing plant with a complex distributing system. It is said that in constructing Cincinnati's Speedway last summer, Contractor Edward Ryan effected a great saving in pouring the 8000 concrete supporting columns for the race track by using three Ideal Cincinnatus mixers, No. 5.

The Koehring Mixer Magazine

Clever indeed are many of the things contained in the little magazine issued by the Koehring Machine Company, Milwaukee, Wis. It is entitled "The Koehring Mixer," with a subtitle "A Periodical of Pluck—A Magazine of Enthusiasm," the latter giving a hint of the editorial policy. Its ambitious and philosophical articles are very much worthwhile, seeming to bear that rare quality—individuality. The issue before us contains but little of an advertising nature, there being only a double page describing the "Koehring Mixer" and a page devoted to a list of the company's branches and agencies.

Improvement in Hess Pipeless Furnaces

With a view to meeting the growing demands for the pipeless furnace, the Hess Warming & Ventilating Company, 1201 Tacoma Building, Chicago, Ill., has

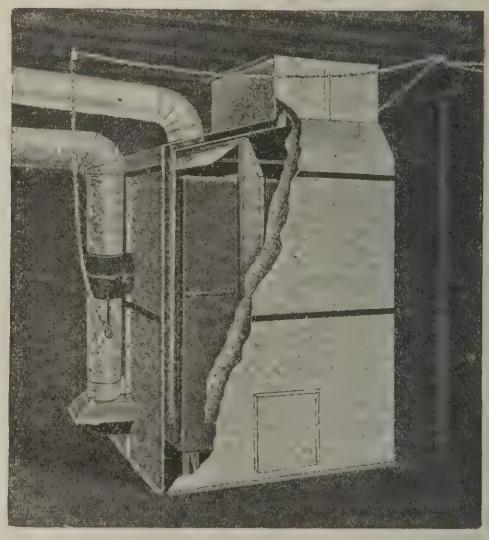


Fig. 9—The Improved Hess Pipeless Furnace

brought out an improvement in its construction which is calculated to appeal to contractors who have noted the limitations of this method of heating when it comes to warming a room shut off from the main apartment in which the pipeless register is placed. Many bungalows are provided with a bath room, a kitchen or bed rooms which do not open into the main living room and which with the usual pipeless method as generally applied are not heated. The velocity of the hot air passing through the main register is such the company states that it is useless to attach a separate small pipe to the main pipe of the ordinary furnace for the purpose of heating a separate room owing to the fact that this results in a reversal of the air through the small pipe and the air is thrown out of the room intended to be

(*Continued on page 34*)

Time Your Workmen

On the Next Job *of* Scaffolding



Find out how much time it takes to put up wooden scaffolds and how much lumber you waste

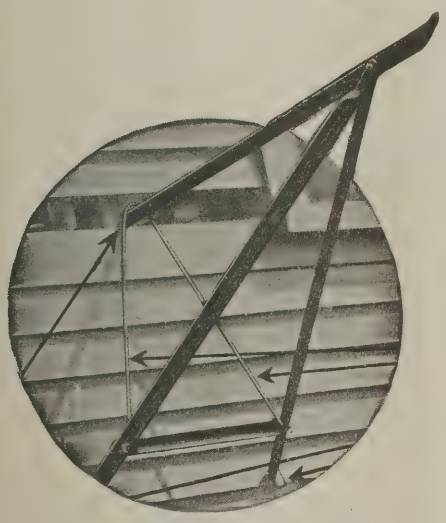
Have you considered this as one of the unnecessary operations in the building business?
Paying big money for wooden scaffolding is like paying for a hole in the ground.
The time it takes to put up a wooden scaffold has delayed many a job contracted for on time.
Why not use

"TROUBLE-SAVER" SCAFFOLDS

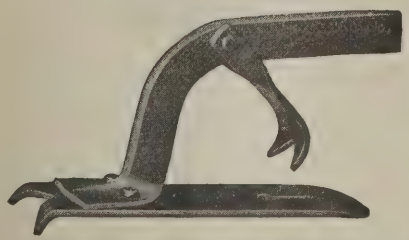
and cut out the useless expense and wasted energy connected with the old-fashioned wooden scaffold. Get in line with the modern up-to-the-minute ideas for success.

A HALF-DAY'S WORK IN TEN MINUTES

no nails to drive—no bother with screws or bolts. Simply hook the bracket around the studding.



"TROUBLE-SAVER" SCAFFOLDS



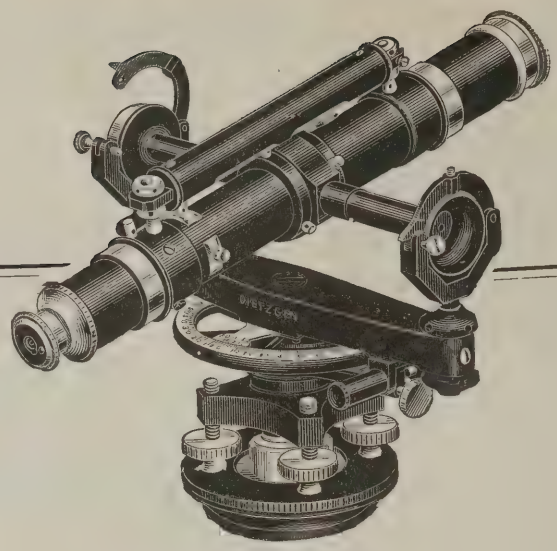
"SNAPPING TURTLE" LIGHTNING SHINGLER

Another BIG TIME SAVER

The "SNAPPING-TURTLE" Lightning Shingler, a small "Trouble-Saver," is just as efficient in its line. One man can nail on five hundred more shingles than he can with any other bracket.
Both these "Trouble-Savers" are sold on a 30-day Free Trial offer, just to prove that they *are* an investment.
Write today for our proposition, and see how much you can save.

The Steel Scaffolding Co.

Evansville, Indiana



Sturdily Built

A glance at the cut shows how substantially the

Dietzgen No. 6013
Convertible Architect's Level

is made. It can be quickly changed into a plumbing transit—will hold adjustment—is easy to operate—will stand hard service.

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EUGENE DIETZGEN CO.
Manufacturers
Surveying Instruments Measuring Tapes Drawing Materials
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"YANKEE"
Plain Screw Drivers
STANDARD No. 90
CABINET No. 95

They cannot loosen in the handle, in use or abuse.

You have our Guarantee.



They are durable as the high grade steel that composes them, and will render faithful service for generations. The comfortable handle and various lengths of blade make them suitable for all classes of work.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.
Lehigh Ave., Philadelphia, Pa.

heated instead of a supply of hot air being delivered. By means of the improvement, the Hess method for a separate heating chamber in the furnace is disconnected from the main heating chamber which supplies the large hot air register and from this separate heating chamber the warm air for the detached room is drawn. There is a damper placed between the two heating chambers so that if heat is not required in the separate room all of it may be delivered through the main register. The device is said to be simple, novel and entirely successful and application has been made for letters patent covering the construction. A view of the improved construction is shown in Fig. 9.

Annual Exhibit of Work at Pratt Institute

The School of Science and Technology of Pratt Institute, Brooklyn, N. Y., has designated the evening of March 7 as "Visitors' Night," and the public will then be given an opportunity to view the general equipment and to observe the students at work.

Strength and Stiffness of Wall Board

In much the same way as a prospective automobile purchaser looks over the various cars in search of one which has not only a powerful but economical engine, with easy riding qualities, gasoline economy and high tire mileage, the builder seeking a supply of wall board is likely to investigate the various makes on the market with a view to selecting one which can be used in place of lath and plaster. As being of interest in this connection, it should be stated that for ceiling work, strength and stiffness of panels are necessary to counteract the tendency to sag, due to the weight of the panel. Furthermore, with the customary spacing of studs and joists, 16 in. on center and the occasional

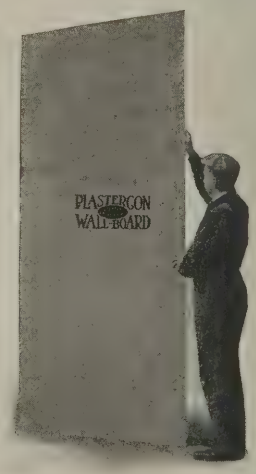


Fig. 10—A Panel of Plastergon Wall Board

spacing of 18 in. and 24 in. the panels must possess great stiffness or they will settle between the supports and make a wall or ceiling that i very irregular. The treating of the wood pulp in Plastergon wall board with chemicals which not only waterproof and "surface prime" it but harden and stiffen it as well, is said to be the method used by the Plastergon Wall Board Company, 2 Philadelphia Avenue, Buffalo, N. Y., who will be glad to send to the readers of THE BUILDING A75 samples of Waterproof Plastergon wall board for testing. A view of a panel is shown in Fig. 10.

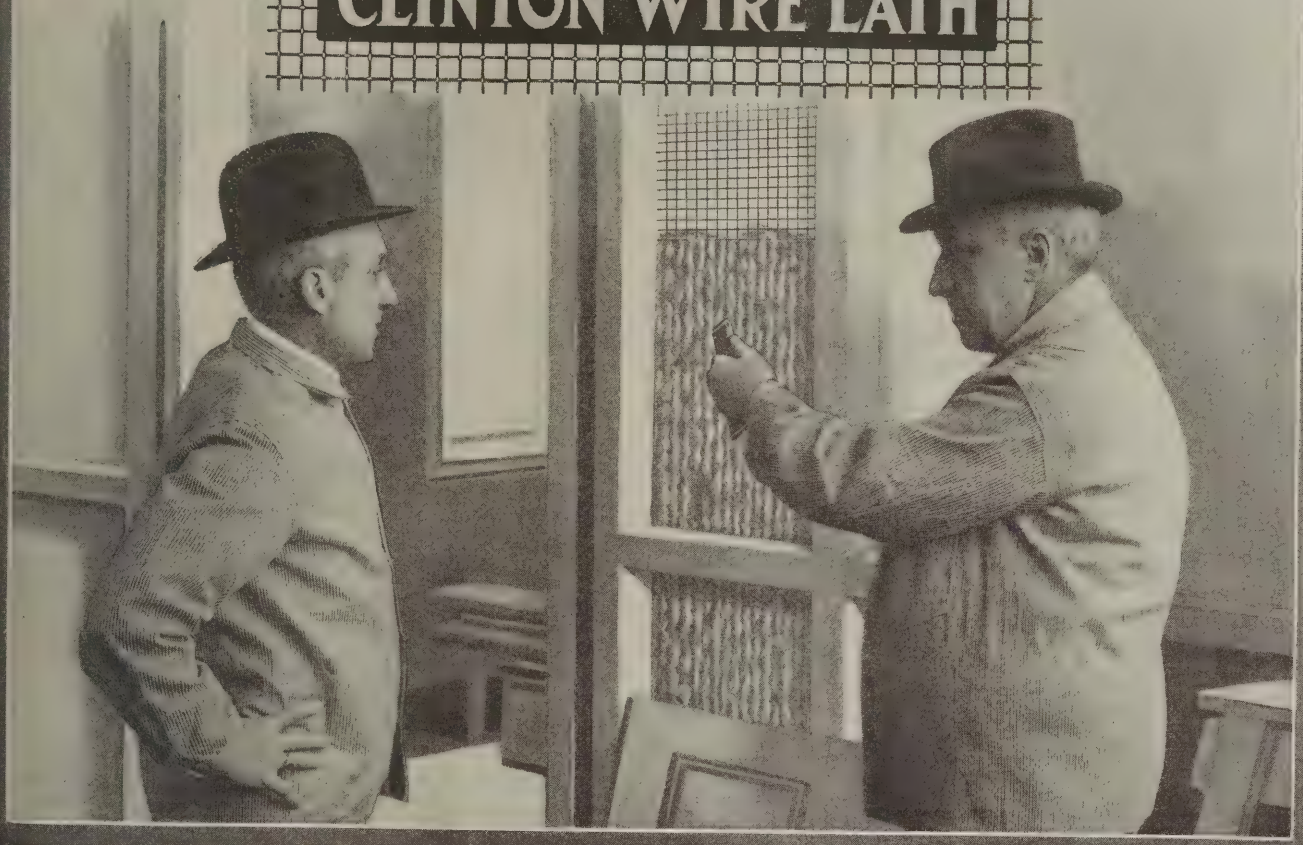
New Appointments by Berger Mfg. Co.

The Berger Manufacturing Company, Canton, Ohio, makes announcement that R. W. Van Horn, for the past six years connected with the New York branch in

(*Continued on page* 36)

"NOTICE THE KEY SIDE"

CLINTON WIRE LATH



"NOTICE THE KEY SIDE OF THIS JOB HERE. CAN you imagine any more thorough clinch? I always specify *Clinton Wire Lath* because it affords such perfect results. Now this complete imbedment of the lath in the plaster coat gives rigid work. It also means that the lath will always retain its original strength because it is protected from the corroding effects of air and moisture."

"Fire, should it run up between partitions supported by *Clinton Wire Lath,* can do but little damage. It cannot reach the lath because that is buried in plaster."

Send for our profusely illustrated book, "Successful Stucco Houses;" *also* "Clinton Handbook on Lath and Plaster." *Both mailed free.*

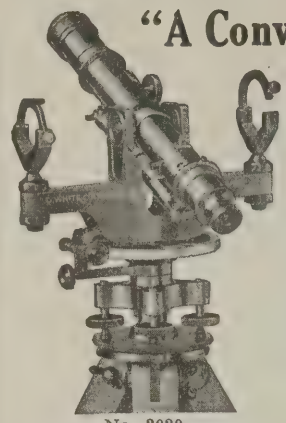
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First Power Loom Weavers of Wire Cloth in the World

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Makers of "Pompeiian" and "Golden Bronze" Screen Cloth, "Clinton" Painted Wire Screen Cloth, Clinton "Silver Finish" Screen Cloth, Clinton Poultry Netting. Clinton Electrically welded Fabric for reinforcing Concrete. Hunt Corner Bead, Tree Guards, Fence Gates, Clinton Perforated Steel Rubbish Burners, Perforated Metals, Perforated Grilles for all architectural purposes.



"A Convertible Level with No Loose Parts"

Here is a convertible level without any loose parts to become lost or out of adjustment. **The cross-bar is drop-centered and cast integral with standards.** You will appreciate this improved convertible level once you let it give you your lines and levels. Let us ship you one to use on your own work in your own way for ten days without obligation. **You'll be delighted with it.** Ask for circular and trial offer.

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN

No. 2020



Nickel Plated

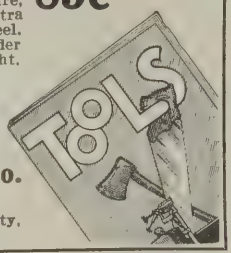
Lakeside
TRADE MARK REGISTERED

Staple Puller and Wire Splicer

6 TOOLS in one — staple-puller, double wire cutter, double hammer, wire splicer for any kind of wire, pincers and bolt wrench. Extra heavy and strong. Drop forged steel. *Nickel plated.* Worth $1.25. Order by No. **85Z2230.** Shipping weight, 2½ lbs. Satisfaction guaranteed or money back.

85c

This is only one of 1000 wonderful tool bargains in our *Tool Book*, free. Write for it. Address house nearest you.



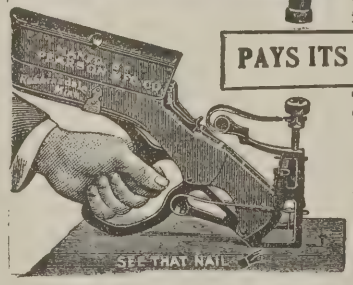
Montgomery Ward & Co.
Dept. A. H. 533
New York City, Chicago, Kansas City, Ft. Worth, Portland, Ore.

Pearson's Automatic Shingle Nailer



Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

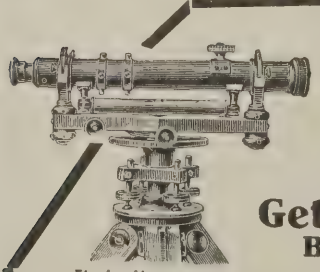
PAYS ITS COST ON ONE JOB



Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.

List price $7.00 (but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools



It's well worth

the small cost of a good Level to *know* your work is error-proof. A mistake may be costly.

Get a KOLESCH Builders' Level

It isn't an expense—it's an investment—one that pays big.

Kolesch Levels are built right. They are light in weight, will stand hard usage and are reasonable in price.

KOLESCH & COMPANY
138 Fulton Street, NEW YORK

charge of the Metal Lumber Department, has been transferred to the home office and placed at the head of the Building Material Products Division. Previous to his connection with The Berger Co., Mr. Van Horn was chief inspector of materials for the Wheeling & Lake Erie Railroad Co.

Norman A. Hill, recently efficiency engineer for the Dupont Powder Company, Wilmington, Del., and formerly engaged in appraisal work for the Public Service Commission in Maryland, has been appointed efficiency engineer with headquarters in the home office of the Berger Mfg. Company. Mr. Hill is a graduate of the University of Pennsylvania and later completed post-graduate courses in both Pennsylvania and Columbia.

P. V. Stonerod, formerly inspector of steel for the Carnegie Steel Company, and for the past few years connected with Berger New York Branch in the capacity of Construction Engineer, has been placed at the head of the Sidewalk Light Department and will be located in Canton, Ohio.

A. H. Bromley, Jr., contracting engineer, who for the last several years has looked after the interests of the Berger Manufacturing Company in the Cleveland territory, has been appointed chief engineer of sales department, and hereafter will be located in the Canton office. Mr. Bromley is an associate of the American Society of Civil Engineers. Some of his former connections were superintendent of Fireproofing Department of the Vulcanite Paving Company, Philadelphia; superintendent and engineer for the Chas. L. Pitts Company, Contractors, Newark; concrete engineer of the Guarantee Construction Company, New York, and estimator and engineer for the Corrugated Bar Company, New York.

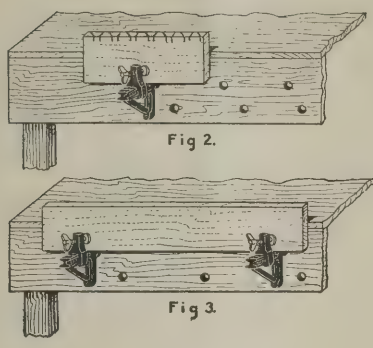
Exhibits at the Recent Hardware Convention

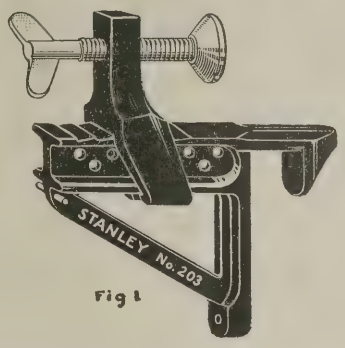
In connection with the four-day convention of the New York Retail Hardware Dealers' Association and the Pennsylvania & Atlantic Seaboard Hardware Association, a mammoth hardware exhibit was held in Madison Square Garden, New York City. Among the exhibitors whose goods were of more or less interest to readers of the BUILDING AGE were the following concerns, each of which occupied an attractive booth:

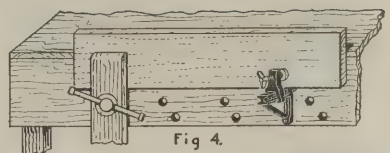
E. C. Atkins & Company, Indianapolis, Ind.
Adams Bros., Pittsburgh, Pa.
American Steel & Wire Co., New York City.
The Barber Asphalt Paving Co., Philadelphia, Pa.
Burglar Proof Lock & Hardware Corp., New York City.
Boston Varnish Co., Boston, Mass.
Bommer Bros., Brooklyn, N. Y.
Berry Bros., Philadelphia, Pa.
The Champion Stove Co., Cleveland, Ohio.
C. M. Childs & Co., Brooklyn, N. Y.
Henry Disston & Sons, Philadelphia, Pa.
Joseph Dixon Crucible Co., Jersey City, N. J.
Eugene Dietzgen Co., New York City.
Chas. H. Gillespie Sons, Jersey City, N. J.
Germantown Tool Works, Philadelphia, Pa.
Griffin Mfg. Co., Erie, Pa.
Goodell-Pratt Co., Greenfield, Mass.
Hart & Cooley, New Britain, Conn.
International Heater Co., Utica, N. Y.
S. C. Johnson & Son, Racine, Wis.
Kelsey Heating Co., Syracuse, N. Y.
Lufkin Rule Co., Saginaw, Mich.
Louden Machinery Co., Albany, N. Y.
Jno. Lucas Co., Philadelphia, Pa.
Lawson Mfg. Co., New York City.
Montauk Paint Mfg. Co., Brooklyn, N. Y.
Matheson Lead Co., Long Island City, N. Y.
H. H. Mayhew Co., New York City.
McKinney Mfg. Co., Pittsburgh, Pa.
National Lead Co., New York City.
New Jersey Wire Cloth Co., New York City.
Richards Wilcox Mfg. Co., Aurora, Ill.
E. C. Stearns Co., Syracuse, N. Y.
Stanley Works, New Britain, Conn.
Standard Varnish Works, Port Richmond, N. Y.
Standard Paint Co., New York City.
James Swan Co., New York City.
L. S. Starrett Co., Athol, Mass.
Stanley Rule & Level Co., New Britain, Conn.
Simonds Manufacturing Co., Fitchburg, Mass.
Sargent & Co., New Haven, Conn.
Sherwin-Williams Co., Newark, N. J.
Valentine & Co., New York City.
C. A. Woolsey Paint & Color Co., Jersey City, N. J.
The A. Wilhelm Co., Reading, Pa.

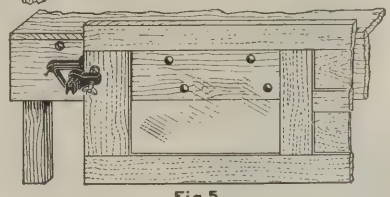
(*Continued on page* 38)

Stanley Tools









STANLEY BENCH BRACKET No. 203

A tool that will immediately commend itself to the Carpenter, the Cabinet Maker or in fact to any one occupied or interested in carpentry or woodworking of any kind where a bench is necessary.

It simply requires that one or more holes (not smaller than one inch) be bored in the front of the bench. The shape of the tool is such that when the jaw or nose is put through the hole, it is automatically held in place, and by means of the screw clamp, the board being worked upon is quickly and firmly secured.

The illustrations show clearly a few of the many ways in which this Bracket may be used. For instance:

Fig. 2. For holding a short board or box end—clamping same sufficiently rigid so that it can be sawed at any angle—as for mitreing, dovetailing, etc.

Fig. 3. For holding a long board (two brackets being used) where a bench vise is not readily available.

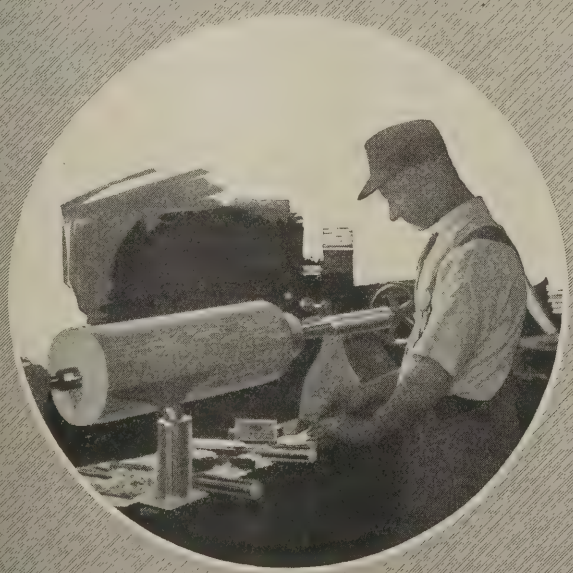
Fig. 4. For use in connection with a bench vise.

Fig. 5. For holding a door or window firmly in place while same is being planed to a fit, or mortised for lock or butts. The nail shown simply holds the bracket in a horizontal position.

For Sale By All Hardware Dealers

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

A Carborundum Sharpening Stone Keeps My Turning Tools On The Job



RIGHT on my lathe—right handy where I can always reach it, is a Carborundum Round Combination Stone. Every once in a while I give my chisels a rub over its free, fast cutting surface and back comes the edge keen and smooth.

That Carborundum Stone keeps my turning tools on the job—keeps them clean and smooth cutting. It holds its shape and it never glazes. Lasts almost as long as the tools themselves.

Your Hardware Dealer has Carborundum Sharpening Stones or you can send direct

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.



No. 44-B

Light Weight Ship Carpenter's Adze

Guaranteed as good or better than any other adze on the market.

Will last twice as long as most adze. Send for our prices and nearest dealer carrying our stock.

Write today.

The L. & I. J. White Co.
10 Columbia Street
Buffalo, N. Y.

ORIGINATORS OF SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government** for over **30 Years.**



The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.

AN IMPROVED CONVERTIBLE LEVEL

The instrument for the critical man — every part is made from the best grade material; each instrument is assembled and tested by expert workmen. "The acme of level construction." Ask for circular "B" and catalog of drawing material



No pins to lose, no screws to tighten, ready in an instant and guaranteed to give perfect satisfaction. This instrument holds its accuracy and will outwear any other.
Our plain Architect's level is built on the same pattern but without the convertible feature. Moderate price. Prompt delivery Unequalled results.

MAIN OFFICE 102 READE ST **NEW YORK BLUE PRINT PAPER CO.** FACTORY 96-102 READE ST
NEW YORK CITY

TRADE NOTES

Information concerning 13/16-in. and 3/8-in. oak flooring is contained in a circular letter being distributed by the Oak Flooring Service Bureau, 1349 Conway Building, Chicago, Ill. On the reverse side is contained a list of prominent buildings in which oak floorng has been used. The name of Factory Oak Flooring has been changed to No. 2 Common.

The Parks Ball Bearing Machine Company, Station A, Cincinnati, Ohio, has found it necessary to increase its manufacturing facilities and is building an addition to its plant. We understand that the company is getting out a new framing machine which embodies a number of interesting features.

D. M. Kagay, for the past three years advertising manager and editor of the two house organs of the Richards-Wilcox Co., Aurora, Ill., has accepted a position with the S. F. Bowser & Co., Inc., Fort Wayne, Ind., as manager of the publication department, the change having taken effect Jan. 1.

A good deal of time is lost in the filling of the ordinary ruling pen, and therefore the "Designo" Fountain Ruling Pen, a new product of Kolesch & Co., 138 Fulton Street, New York City, will be of interest to architects and draughtsmen. It is said to be usable with any ink and is guaranteed to operate satisfactorily. The points are regulated by a screw as is usual, and an ink tube extends part way down between the nibs. To fill the nibs, a cap is pressed, and ink flows down to fill the pen points.

An attractive calendar printed in colors has been distributed by the Universal Portland Cement Company, 208 South La Salle Street, Chicago, Ill. A convenient feature is the printing on each sheet in different colors of the last week of the month preceding as well as the first week of the month succeeding the given month. The last sheet, or page, is devoted to calendars of 1916, 1917 and 1918.

"Small Houses" is the title of a booklet containing plans, elevations, detail drawings, and a description of various constructive features and finish of an attractive five-room bungalow. The cover of the booklet bears a colored perspective of the house, and there is a colored plan showing the arrangement of the flooring. A copy may be obtained by addressing the Interior Hardwood Company, 1339 Beecher Street, Indianapolis, Ind.

Attractive dwellings and other buildings upon which asphalt shingles have been used are illustrated in the *Reynolds Shingle Bulletin*—the house organ of the H. M. Reynolds Asphalt Shingle Company, Grand Rapids, Mich. The *Bulletin* is published each month, and contains in addition to the usual attractive illustrations of asphalt shingled houses, the plan and a description of the finish, together with the cost of some one which has proven particularly desirable. Various other items concerning asphalt shingles contribute to form an interesting monthly.

A large calendar printed in colors and bearing illustrations of numerous tools and apparatus manufactured by F. E. Myers & Bro., Ashland, Ohio, is being distributed among their friends in the trade. Of special interest to THE BUILDING AGE readers are illustrations of garage door hangers. The background of the calendar is yellow, the subordinate color scheme being such as to present the matter in striking form.

(*Continued on page* 40)


Showing Sun-Shade Attachment

Try This Aloe Level 10 DAYS—FREE

Easy Monthly Payments If You Buy

Prove the superior quality of the Aloe Convertible Level by testing it out for 10 days. Use it on your every day work laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning, shafting walls, piers, etc., for getting angles, or levels anywhere and the hundred and one other things for which you would use a level or transit. Then, if you decide to keep it, you may pay for it in easy monthly payments so small that you will scarcely feel them.

Aloe Convertible Level

is more than a mere level. It is a modified transit permitting double the range of work possible with an ordinary architect's level. Its construction is such that sights above or below the horizontal can be taken, making it the finest instrument ever offered at anywhere near the price. For taking vertical sights the instrument is provided with a special convertible bracket rigidly and permanently attached to the cross-bar thus eliminating the extra time that other instruments require for changing the telescope in position to take vertical readings. The telescope which is fitted with a permanent axis, rests in the bracket bearings and owing to our special constructed clips the instrument can be used for leveling while in this position if desired, although the bracket clips are easily and quickly released from the telescope axis when levels only are to be taken. The telescope is then set in its normal position in the wyes and you have overcome the old method of attaching and detaching the convertible bracket.

Your Own Time To Pay—No Interest

Remember, you are under no obligation whatever to keep the Aloe Convertible Level. We do not even ask you to promise to buy. But you owe it to yourself to see and try it. If it isn't all you expect you may return it at our expense. If you do keep it, you will find the small monthly payments easier than paying rent for an instrument—and at the end of a few months you will own it—absolutely. There's no red tape about this offer—we ask no embarrassing questions—everything is confidential—we charge no interest. You have practically your own time to pay.

Mail Coupon for Descriptive Circular

It explains the Aloe Convertible Level in detail and shows how easily the man without the training of the engineer or surveyor may secure the same accurate results as the expert. Send your name on coupon or postal for free copy and full particulars of our original, unique and popular selling plan.

A. S. ALOE CO., 625 Olive St., St. Louis, Mo.

Mail Coupon NOW

A. S. ALOE COMPANY,
625 Olive St., St. Louis, Mo.

Please send free descriptive circular about the Aloe Convertible Level and complete details of your easy payment plan. This request in no way obligates me.

Name.....

Occupation.....

City..... State.....

Are you with the big majority?

A recent canvass of hardware stores again verified the fact that by far the greatest number of saws sold to mechanics are

DISSTON SAWS

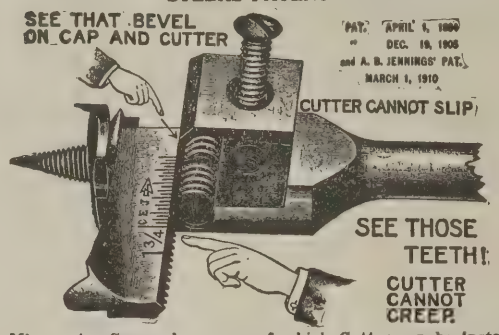


This means that most of the men who are in a position to **know**—whose reputation and success demand that they use the best—are using the saw that has been acknowledged best for more than three-quarters of a century. Are you one of these men?

As a mechanic, our Handbook S will interest you. Send for it, it's free.

Henry Disston & Sons, Inc., TRADE MARK REG.U.S.PAT.OFF. Philadelphia, U. S. A.

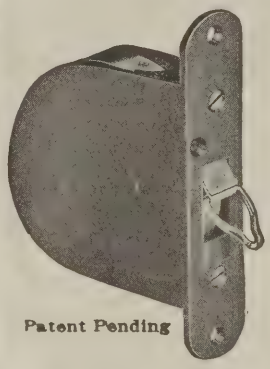
C. E. JENNINGS EXPANSIVE BIT
STEERS PATENT



Note Micrometer Screw, by means of which Cutter can be instantly adjusted to a Thousandth part of an inch.

C. E. JENNINGS & CO. *Sole Mfrs.* 71-73 Murray St., N. Y.

CALDWELL SASH BALANCES
UNIFORM MORTISES



For use in all classes of new work

Box frames unnecessary

Mortises cut at mill reduce cost of installing. Counterbalance sashes at any given point. They outwear ordinary weights and cords. Unaffected by atmospheric conditions.

Cheapest method for modernizing old windows, as alterations in sashes and frames are not necessary. Sashes should be weighed before ordering.

Write for Circular

Patent Pending

Caldwell Mfg. Company
5 Jones St., Rochester, N. Y.

COPPER CABLE SASH CHAIN



Thomas Morton
245 Centre Street
NEW YORK

COPPER CABLE
STEEL CABLE
CHAMPION METAL
STEEL CHAMPION

SASH CHAINS

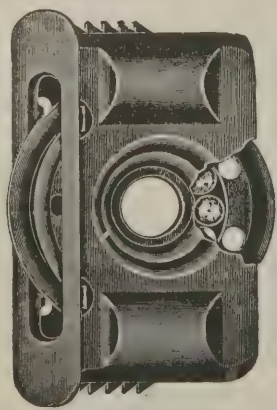
CHAINS

For Suspending Heavy Doors Gates, Etc.

All of SUPERIOR QUALITY



CHAMPION METAL SASH CHAIN



No. 10 Ball Bearings

"Grand Rapids"
All Steel
Sash Pulleys

Fasten automatically. No nails. No screws. Just bore 4 holes.

The automatic saw tooth fastening feature and the easily made mortise will save in labor the cost of the pulleys.

Frictionless, Noiseless, Everlasting.

Write for free samples.

Grand Rapids Hardware Co.
160 Eleventh Street, Grand Rapids, Mich.

An attractive calendar for 1917 was distributed early in the year by the Atlas Portland Cement Company, 30 Broad Street, New York City, N. Y., conspicuous features being a border printed in imitation of stucco, and at the top of the page devoted to each month an illustration of some notable structure in which Portland cement has been used.

The Atlas Roofing Company, 117 Clark Street, Newburg, N. Y., has recently sent out a handsome calendar, the feature of which is a reproduction in colors of the fine painting of a Scotch scene. This is a continuance of the custom of the company for several years to complete a series of such pictures. The calendar is particularly tasteful and contains no advertising except under the date sheets and consisting of the name and address of the company together with a brief line of its business and the quality of work which it guarantees to do.

At a special meeting of the directors of the Joseph Dixon Crucible Company, Jersey City, N. J., held on December 22nd, Julian H. Schermerhorn, for a number of years treasurer of the company, was elected a vice-president and William Koester, who has for a number of years been credit manager, was elected to the position of treasurer. Both became effective Jan. 1.

The American Cement Machine Company, Inc., Keokuk, Iowa, decided at the yearly meeting of the stockholders to increase the capital stock in order to meet the requirements of its rapidly growing business. The company states that 1916 was an extremely prosperous year for it.

The American Oak Manufacturers' Association, recently organized in Memphis, Tenn., has elected J. T. Kendall permanent secretary. He was the assistant secretary of the Gum Lumber Manufacturers' Association ever since its organization and is therefore thoroughly familiar with his new duties.

An enjoyable trip through the mountains of Utah was made in December in a 1½-ton Federal motor truck, and an interesting description thereof is contained in the February issue of *Traffic News*, the house organ of the Federal Motor Truck Company, 31 Leavitt Street, Detroit, Mich. The road wound through hills covered with snow, and the difficulties had baffled many pleasure cars, but the steep climbs were successfully made by the Federal.

Eugene G. Groves, architect, has removed from 329 Gas and Electric Building, Denver, Colo., to 222 Foster Building, that city.

The February issue of *Door-Ways*, the house organ of the Richards-Wilcox Mfg. Co., Aurora, Ill., contains a description of various installations of R-W Trolley Overhead Carrying Equipment used in the manufacture of automobile cushion springs. A calendar bearing the caption "Recreation" and depicting a pretty girl sliding down hill on a toboggan, accompanies the monthly, and on the reverse side of the calendar is stated the applicability of the caption to R-W products.

The National Safety Council, established to further the cause of accident prevention, has a committee of fifty safety experts working out the maximum and minimum requirements in that direction. The findings of these experts are being presented in "Safe Practice" leaflets, among which mention may be made of those on "Ladders, Stairs and Stairways," and "Boiler Rooms." Interested readers may secure further information by addressing W. H. Cameron, general manager The National Safety Council, 208 South La Salle Street, Chicago, Ill.

Containing Plans of This House: Also Colored Supplement and Plans

BUILDING AGE

UNIVERSITY OF ILLINOIS LIBRARY



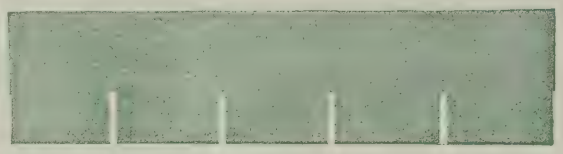
APRIL, 1917

PRICE 20 CENTS

Hudson Strip Asphalt Shingles



Save Money and Time



Can be laid in less than ½ the time and with less than ⅔ of the nails that it takes to lay other shingles. Labor cost is a big item today and it can be greatly reduced by using these shingles.

Send for particulars.

Asphalt Ready Roofing Co.

HUDSON ASPHALT ROOFING PRODUCTS

Dept. 52, 9 Church Street

New York

Send particulars regarding Hudson Asphalt Strip Shingles.

Name .....

Address .....

.....

FLOORS

The Wood-Mosaic Kind

WOOD-MOSAIC FLOORING

For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips, Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

32 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory, New Albany, Ind.
Sales Office and Parquetry Factory, Rochester, N. Y.

Bay State *Agatex*

Cement is porous. The first drop of grease spells ruin to the even, good looks of your floor. No amount of scrubbing will rejuvenate it. Water is absorbed and the resulting dampness is unhealthful. Constant friction creates dust, cracks and pits. And *think*—a little precaution—a coat of Agatex will keep your floor *new*.

Two coats of Bay State Agatex cover your floor. It sinks in and binds every little particle of cement.

It makes the floor wearproof, waterproof, oilproof, dustproof and every-other-kind-of-proof.

Send for our booklet No. A 19. It tells how and why you should use Agatex, also what it costs.

Bay State Brick and Cement Coating makes brick, cement and stucco walls waterproof. Made in white and a variety of tints. Send for sample and Book No. 19.

WADSWORTH, HOWLAND & CO., Inc.

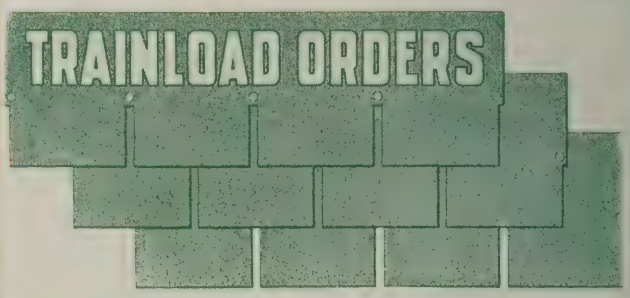
Paint and Varnish Makers

Boston, Mass.

New York Office:
Architects' Bldg.



TRAINLOAD ORDERS



Rex Strip Shingles—Dark Red or Grayish Green

WITHIN forty-five days the leading lumber and building supply dealers in one city of less than 100,000 population ordered enough Rex Strip Shingles to cover 584 houses!—(16 squares per house).

There would be fifty-six carloads if we could ship all the orders at one time—a trainload of 840 tons of Rex Strip Shingles!

Now—we leave it to you if that is not Some Shingle Business from just one hustling little city!

The dealers mentioned believe in Rex Strip Shingles. They find them profitable to handle. They order heavily only because the turnover is so rapid.

We have a beautifully illustrated Catalog that describes Rex Strip Shingles—and twenty-two other Rex Products. It also contains much valuable information about all kinds of roofing materials. If you want a copy, just write your name and address on the margin of this page below, mail to us, and we will gladly send it.

Flintkote Manufacturing Co., Inc.

98 Pearl Street, Boston, Mass.

NEW YORK 1104 Equitable Bldg. CHICAGO 651 Peoples Gas Bldg. NEW ORLEANS 701 Hennen Bldg.



The Building Age

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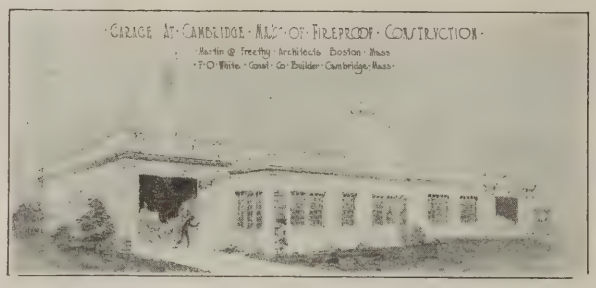
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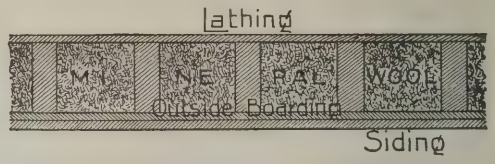
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Section of Outside Wall of House, Showing Wool Between Studding.

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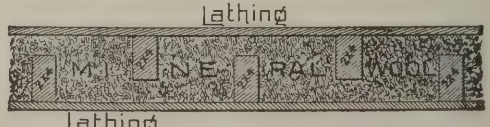
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BUILDING AGE

NEW YORK, APRIL, 1917



RESIDENCE OF ARCHITECT KARL E. MORRISON AT ERIE, PA.—VIEW SHOWING ENTRANCE PORTICO AND ENCLOSED LIVING PORCH

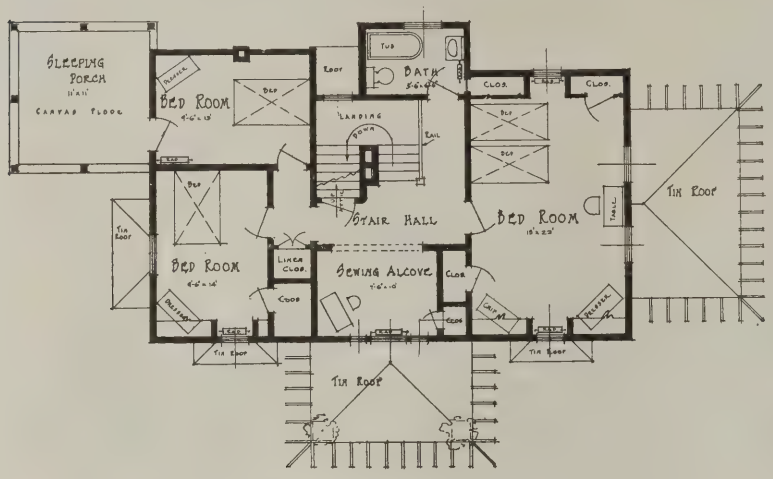
HOME OF A PENNSYLVANIA ARCHITECT

DOUBLE FOUNDATION WALLS OF CONCRETE— SHINGLED SIDES AND ROOF — COST $3,500

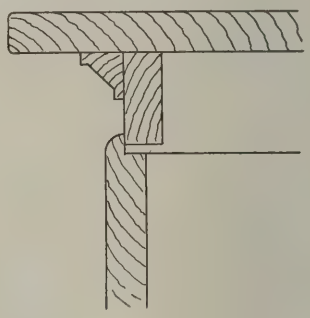
WE have from time to time presented in these columns pictures and drawings of attractive houses which architects have designed for their own occupancy, each and every one affording an excellent study for the prospective home builder who naturally desires a compact and convenient arrangement together with all those little refinements which go to make up the ideal home. Such designs always attract widespread attention as they are regarded by many as typical of what a modern dwelling should be, bearing in mind the fact that each is planned to meet specific individual requirements. In this connection we take pleasure in presenting another excellent example of dwelling which an architect designed for his own use and which gives evidence of unusual thought and study in working out its many details. In its exterior aspects noticeable features of the house are the treatment of the pergola entrance, the gable directly overhead, the dormers which break up the roof lines, the sleeping porch over the laundry and the living porch shown at the right in the picture which we present upon this page.

In the floor plans which are a direct reproduction of the architect's drawings, not only is the location of the various rooms indicated, but also the principal pieces of furniture with which they are equipped. Entering the main hall from the porch the visitor finds at the right a living room extending the full depth of the house and out of which opens an enclosed porch, an interior view of it being afforded by one of the pictures given herewith. A striking feature of the living room is the Ingle nook with its open fireplace flanked on either side with a convenient seat. At the left of the chimney and fireplace rises the main flight of stairs, at the foot

of which is a coat closet with full length mirror in the door. Beyond the Ingle nook of the living room is the architect's den, communicating with the living room on one side and with a rear hall on the room with its built-in buffet placed under a high window and beyond, communicating by means of a double swing door, is the kitchen provided with cupboards, range, sink, etc. At the left of the



Second Floor—Scale 1/16 In. to the Foot



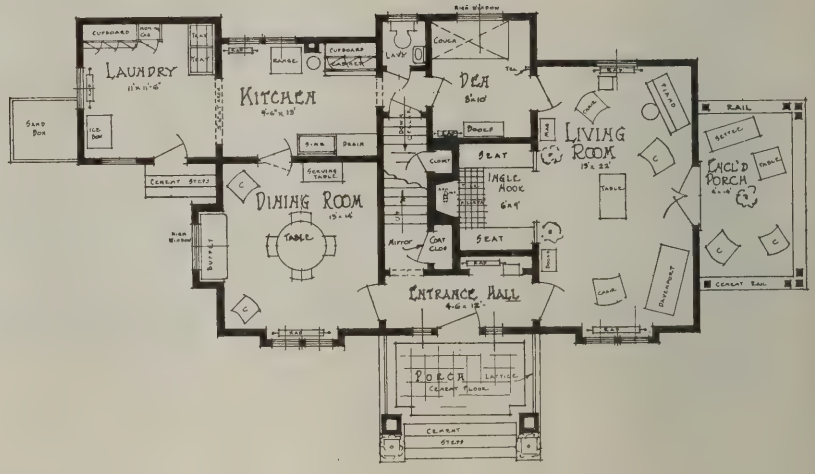
Detail of Counter Shelf of Laundry Cupboard—Scale 3 In. to the Foot



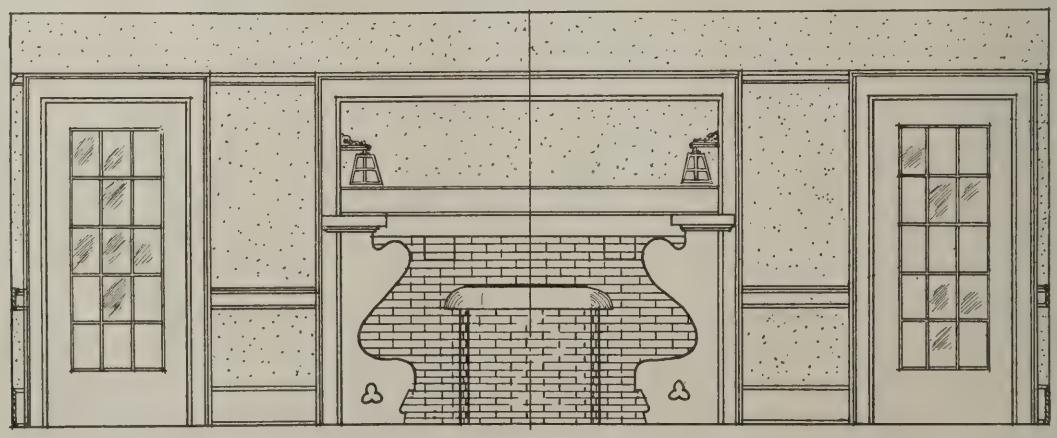
Base—Scale 3 In. to the Foot



Section of Casings and Chair-Rail—Scale 3 In. to the Foot



Main Floor Plan—Scale 1/16 In. to the Foo.



Elevation of "Ingle Nook" Looking Directly Toward the Open Fireplace

other. From this rear hall opens a toilet and directly opposite it are the stairs leading to the cellar, conveniently placed as regards the kitchen.

At the left of the main entrance hall is the dining kitchen is the laundry with wash trays, cupboards and ice box.

On the second floor are three sleeping rooms, a sewing alcove and a bathroom, the latter being so



ANOTHER VIEW OF RESIDENCE OF ARCHITECT KARL E. MORRISON, SHOWING SLEEPING PORCH OVER THE LAUNDRY AT THE EXTREME LEFT

placed as to concentrate the plumbing and reduce the cost of installation to a minimum. The master's bedroom is directly over the living room and occupies the full depth of the house. At the opposite end are two sleeping roms, one of which communicates with a sleeping porch, 11 x 11 ft. in size, and having a canvass floor. It should be noted that the broad landing of the main flight of stairs is lighted



INTERIOR VIEW OF THE ENCLOSED PORCH SHOWING THE RUSTIC FURNITURE

by an outside window just above the roof of the lavatory on the first floor.

A special feature of the house to which the architect-owner calls attention is the complete circulation on the first floor. The kitchen is made the center of the house and, as he puts it, "we can serve the dining room, often eat in the laundry or can go in a straight line to the living room when we have receptions. It is a big advantage to have the laundry handy on the first floor with ironing cabinet near. We have electric flatirons, which are kept in the space under the board."

The frame of the house is of No. 1 Pennsylvania hemlock with hemlock sheathing and sub-floors. The foundation walls are double, consisting of two 4-in. concrete walls with 2-in. air space between. The concrete footings are 22 in. wide and 8 in. deep and consist of one part cement, two parts sand and five parts gravel dug on the premises and washed by means of a trough and running water. The foundation walls are of the same mix. The underpinning is of panel-face 8-in. concrete blocks.

The studs are 2 x 4 in. and the rafters 2 x 6 in. Over the hemlock sheathing which encloses the exterior frame the side walls are covered with 24-in. Washington red cedar shingles having a half-inch butt and exposed 10 in. to the weather. The roof is covered with 16-in. Creo-Dipt shingles laid 4½ in. to the weather.

The porches are built up of rough hemlock girders and rough No. 1 chestnut rafters. The sheathing is matched and dressed and the under side stained a rich brown to match the hemlock and chestnut. The floor of the main entrance porch is of cement, colored red and marked off into squares.

The finish floors in the living room, dining room, den and entrance hall are white oak furnished by the Wood Mosaic Company, Rochester, N. Y., and in the second-story rooms the floors are rift sawed yellow pine.

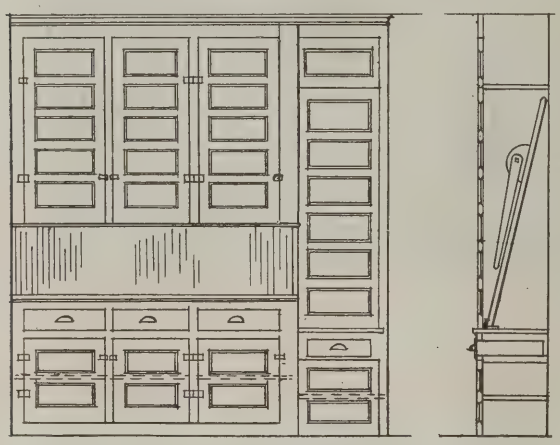
The living room and den are finished in Early English oak and the dining room in fumed oak. The kitchen and laundry are in yellow pine and the entrance hall, as well as the entire second story, in birch and white enamel. The yellow pine woodwork is finished natural. The stairs have birch treads and handrail and the doors have birch panels.

The house is heated by a direct radiating hot water system, use being made of a "Buffalo" boiler made by the Buffalo Radiator Company. The position of the various radiators is clearly indicated on the floor plans. Hot water is furnished by a Beler automatic hot water heater.

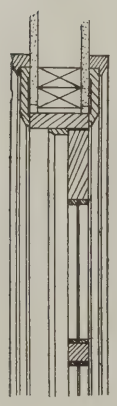
The house is wired throughout for electricity and natural gas is used for the range in the kitchen.

The architect states that in decorating the house he used an imitation grass-cloth in connection with the Early English in the living room; a heavy leather effect under the chair rail in the dining room with browns and tans to harmonize with the fumed oak. In the entrance hall he used an English floral design in light grays and blues. The bathroom and kitchen are painted in two coats of Keystone Varnish Co.'s "Keystona" flat wall paint, light terra cotta in color.

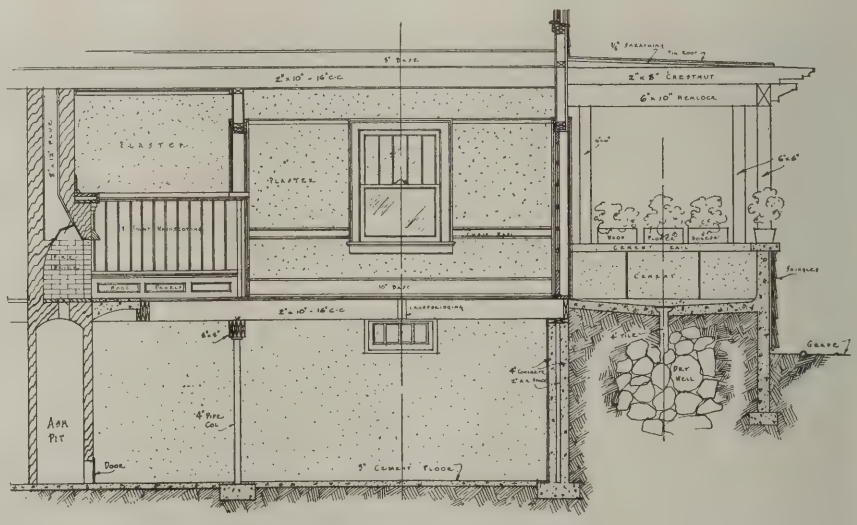
The bathroom has a gas heater set in the wall, also a white enamel steel medicine cabinet with plateglass shelves. The room is fitted with water closet, bathtub and lavatory—all of the type turned



Elevation and Section of Laundry Cupboard and Ironing Board Cabinet—Scale ½ In. to the Foot



Vertical Cross-Section Through Door and Frame



Vertical Longitudinal Section Through the Building—Scale ⅛ In. to the Foot



VIEW TAKEN FROM REAR OF LIVING ROOM AND LOOKING INTO THE INGLE NOOK, WITH A GLIMPSE OF THE "DEN" AT THE EXTREME RIGHT



DINING ROOM IN HOME OF ARCHITECT KARL E. MORRISON SHOWING BUILT-IN BUFFET AT THE LEFT AND THE KITCHEN AND LAUNDRY AT THE RIGHT

out by the Standard Sanitary Mfg. Company.

The height of the cellar is 7 ft. in the clear, the first-floor rooms 9 ft. and the second-floor rooms 8 ft. 6 in. in the clear.

The 24-in. Washington red cedar shingles on the side walls and the 16-in. roof shingles were furnished by the Creo-Dipt Company, Inc., 1030 Oliver Street, North Tonawanda, N. Y. The shingles on the side walls were treated with two coats of Samuel Cabot's old Viriginia white. The double concrete walls of the foundation were built with a Van Guilder machine made by the Van Guilder Double Wall Company, 20 Wagner Building, Rochester, N. Y. The brick fireplace in the living room is of Corry "Orientals," made by the Corry Brick Company, Corry, Pa.

According to the figures furnished by the architect, the principal items of cost include:

Excavating and cellar wall	$240
Rough lumber	420
Mill work	683
Carpenters' labor	619
Porches	200
Cement cellar and walks	55
Shingles	180
Outside painting and staining	65
Inside painting and finishing	192
Heating	306
Plumbing	350
Electric wiring	48
Electric fixtures	84

The very attractive frame residence here shown is the home of Karl E. Morrison, Erie, Pa., a member of the architectural firm of Shutts & Morrison of that city, and the drawings and specifications were prepared by that concern.

The contract for the cement work was executed by James S. Shadduck, 1020 Buffalo Road; the heating and plumbing by C. W. Brooks, 919 E. Twenty-first Street; the electrical work by Garvin Electric Company, Twelfth and Peach Streets, and the decorating by the Hayes Wall Paper Company, 917 State Street, all of Buffalo, N. Y. All other work was done by the day.

BUILDERS AND MOTOR TRUCKS

A writer in a recent issue of the *Bulletin* of the Master Builders' Exchange of Philadelphia, Pa., has this to say about the use of motor trucks by building contractors.

Very few men in the building trades in this city are now without automobiles. The reason is obvious. A builder with a number of operations, many of which are inaccessible by trolley or train, finds the motor car a time-saver of notable value. Many building concerns have several cars for the use of their foremen and inspectors. And what is true of Philadelphia is true of the country. No statistics have yet been compiled of the 4,000,000 automobiles in operation, as to the number used by men in the building trades, but the figure is unquestionably large. And the same holds good for motor delivery vehicles.

The last few years showed a great increase in the adoption of motor trucks by members of the Builders' Exchange. Why? Sensible salesmanship displaced the old-fashioned selling methods. The motor vehicle people studied the building business and its problems. They sold service rather than machines. Trucks were built to fit the builder's needs. The brick men, for instance, recall the old arguments used to sell them machines. Now the brick men use trucks to advantage. And so do all the men in the building trades.

THE MATERIALS REQUIRED FOR BRICK WORK

It is a matter of great convenience to the mason builder to have readily at hand figures showing the number of brick required for 1 sq. ft. or 1 sq. yd. of wall of different thicknesses and the quantity of mortar necessary to lay 1000 brick with joints of various specified thicknesses.

To meet such requirements W. B. Wreford of the Detroit Brick Manufacturers' and Dealers' Association has compiled the following data which is likely to prove of value.

The number of brick required for square foot and square yard in walls of different thickness is as follows:

Wall.	Sq. ft.	Sq. yd.
4 in., veneer	7	63
9 in., solid	14	126
13 in., solid	21	189
18 in., solid	28	252

The standard size brick, 8.25 x 4 x 2.25 in., is used as the basis of the foregoing table, the brick being laid with mortar joints, one-fourth of an inch thick, each brick and the mortar beneath being calculated as having thickness of 2.5 in.

The quantity of mortar required for each 1000 brick, with joints of different thickness, is estimated as follows:

Joint Thickness.	Mortar, Quantity.
3/16 in.	8 cu. ft.
¼ in.	10 cu. ft.
5/16 in.	12 cu. ft.
⅜ in.	15 cu. ft.
½ in.	18 cu. ft.
⅝ in.	22 cu. ft.
¾ in.	26 cu. ft.

To lay 1000 brick in lime mortar with proportions of one of lime to five of sand and joints ⅜ to ½ in., requires three bushels of quicklime and 18 cu. ft. of sand.

To lay 1000 brick in Portland cement mortar, in proportions of one of cement to three and one-half of sand, and joints ⅜ to ½ in., requires 1¼ barrels of cement of five sacks and 18 cu. ft. of sand.

The rising cost of lumber to consumers, which held generally up to 1907, is attributed by the Forest Service primarily to the exhaustion of the supplies of timber nearest to the bulk of eastern consumers, and the necessity of transporting lumber from greater and greater distances.

SUGGESTIONS FOR BUILT-IN FURNITURE

SOME INTERESTING EXAMPLES FOR THE CARPENTER WHO IS CLEVER IN HANDLING TOOLS

BY PAUL D. OTTER

THE house of four-walled rooms put up "For Sale" offers little attraction to the home seeker, while at the same time it quickly depreciates in value as compared with the dwelling having built-in conveniences and comforts embodied in the original construction, or which have later been provided. Indeed, the home, however small, has a ready sale, or rented value, as compared with the four-wall type, even though the cubical content of each room has to some extent been sacrificed in providing for alternating closet, window seat or sideboard recess. Such features are in the early reckoning of home beginning and are considered as furniture, taking the place of what heretofore have been considered the bulky, objectionable pieces which, as a rule, never fitted in when a move was made from one house to another.



Fig. 1—A Pull-out Hall Seat and Chest

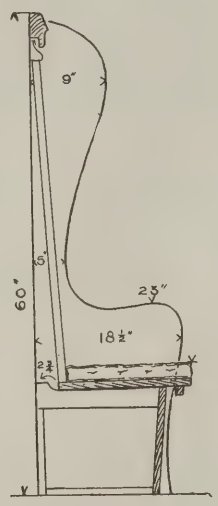


Fig. 2—End Elevation and Section of Seat Shown in Fig. 1

Embodied furniture also appeals to our ideas of sanitation, being cleaned and renovated with other woodwork in the same manner. Another feature to recommend it is that it cannot be moved around marring floors or breaking plaster and does not accumulate dust underneath.

In considering such a subject no specific measurements can be given, the aim being to suggest and picture the features which may appeal to individual needs and set the mind of the craftsman working in a most interesting field of carpentry and cabinet making.

Whatever may be done in the way of building inside or out should be in keeping with the interior trim of the house, or if a new trim is introduced have it the same throughout the room, and of a simple mold, in hard pine, oak, chestnut, ash, butternut, gum or cherry. A room, or rooms, in cream enamel will prove most satisfactory, particularly for those on the upper floor.

Where it is possible to do so, the craftsman should give consideration to position, particularly as to lighting, placing settles and desks in a jamb where daylight may fall on the proper side for writing or reading. Should a dark side of a room be the only place for built-in book shelves, a flexible cord and "auto-trouble light," will enable a book to be found readily in this day of twenty-four-hour electric service.

An interesting relation should exist between wainscot, if any, and the added or built-in feature, by framing about, dropping down or raising the molding to it, so that it be included and become really a part of the room. Due consideration should be given to proportion and divisions or panelings. Avoid cutting a height in two by equal divisions, but rather be guided say, by the proportions of a standard paneled door. Shelves and other spacings may be made more attractive by varying or alternating the divisions.

Certain oblong niches become the logical place for a seat and bunker, or under-chest. Such jambs or recesses too often are so narrow that the seat with

the straight wall back is far from comfortable. This, however, can be greatly overcome when the seat is to be used, by drawing it forward over the front edge of the bunker; the back or wainscot being hinged to the rear of the seat comes forward at bottom, giving a comfortable angle to back and at the same time the front edge of the seat is raised



Fig. 3—Utilizing an Unused Bedroom Door or Closet for a Compact and Convenient Dresser

pitch of the roof and standard ceiling height, making square cornered rooms, which are probably less expensive than a cambered ceiling would be. Here the built-in idea presents opportunity of redeeming certain space from a waste attic by projecting a built-in dresser, or other features through the wall, and in this way avoiding one or more portable pieces about the room.

Unused or poorly located doors offer a recessed framing by either removing the door and using the full depth of the frame for a permanent dresser, wardrobe or bookcase or from the locked door build them into the room sufficiently deep for the re-



Fig. 5—Toilet Cabinet in Bathroom Wall

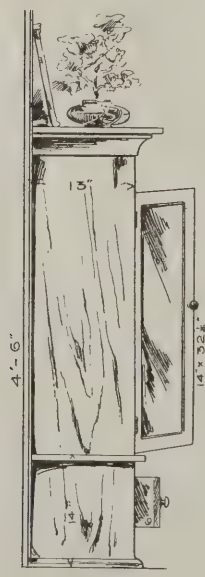


Fig. 6—A Built-out Bookcase

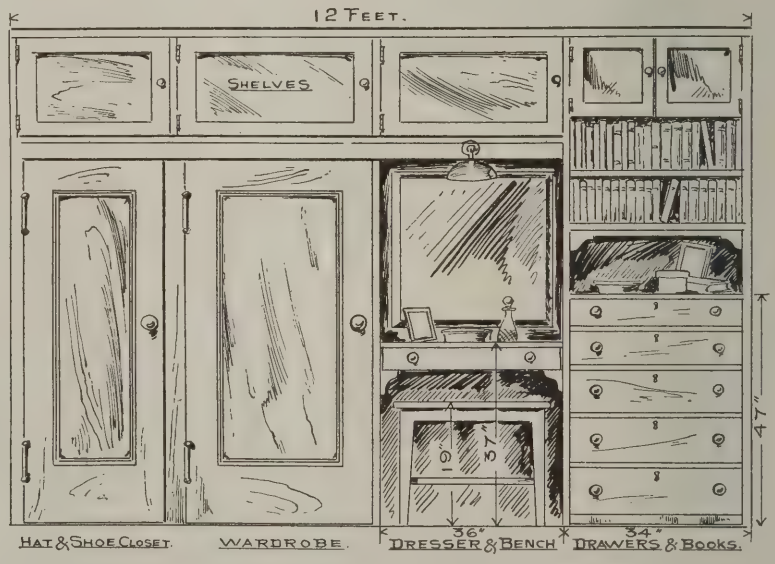


Fig. 4—Bedroom Conveniences Occupying Full End of a Room

up the height of bottom cleat, all as shown in Figs. 1 and 2. The under-chest of such a seat proves an actual necessity for table cloths, which may be laid in long folds, and tray space provided above for doilies.

Bedrooms are frequently made smaller than they should be owing to the size being determined by the quired purpose and provide single or double doors of a light character, as indicated in Fig. 3. Composition or utility board for such plans or alterations will be found most serviceable, particularly when the work is to be finished in white enamel.

Bedroom requirements are suggested in Fig. 4, where the dressing stand, wardrobe, drawers and

book shelves built into one end of a girl's bedroom take the place of similar portable pieces which would in a small room occupy much more space. A drawer should be placed under the shelf of the dressing mirror, for toilet articles, and an oblong bench occupy the under space when not being used. The wardrobes to the left should be full height for dressers, and a portion of it subdivided to hold at least three full size hats—far be it from me to say what size that should be—but have the space sufficiently large for any emergency of style.

The bathroom should be as free from movable furniture as possible, or any projecting articles on the wall. In the old style of house it is a simple matter to remodel a bathroom to the atractive and sanitary character of present day ideas, and the first impression is the use of simple molding and the purity that white paint and cream enamel suggest. An opening in the wall over lavatory permits of the toilet and medicine cabinet to be placed to the depth of a 2 x 4 in. studding and trimmed off with a simple door frame holding a good grade of beveled mirror.

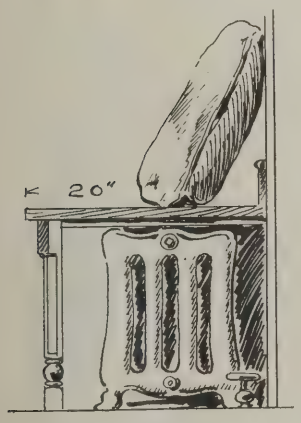


Fig. 7—Window Seat Over Radiator



Fig. 8—Front Cover for Radiator Shown in Fig. 7

The feature in this cabinet, shown in Fig. 5, is the lower partly exposed shelf. In the planning of a house a soiled clothes chute may oftentimes be worked into the plan of bathroom and have its exit in the laundry in the basement by a smooth board or metal lined boxing between walls.

The dining room has many possibilities in built-in furniture, chief of which are the fixed buffet or the large sideboard with drawer of such capacity as to hold table cloths ironed with as few folds as possible.

The plan adopted in recent years by the builders of moderate priced homes is to project the sideboard beyond the face of the outer wall its required depth, and provide with a roof, then the completed carcase is set in and trimmed off with the molding of the room. Care should be taken to previously line well with insulation on inside of clapboarding or stucco, or there will be a just reason for complaint from choice cut glass cracking in extreme cold weather.

The present day living room of large size or oblong in character presents possibilities in built-in or fixed furniture and aids greatly in giving a complete but not overcrowded impression. Fig. 6 shows an end view of bookcases built in at one end of the living room intercepted by a 3 ft. door leading into a sun room. Above the two cases of equal length are low windows 3 ft. 3 in. in width. The ample 16-in. top provides more generously than any portable furniture for the placing of statuary or any choice bric-a-brac or pictures. Three rows of book shelves are behind double doors facing each other with 2-in. stiles between. The lower portion is given over to most useful drawer space.

A row of windows occupy the front of this particular room, under which to hide the radiator. A 20-in. window seat provides another source of furnishing and convenience not usually appreciated, all as shown in Fig. 7.

Exclusion of radiator from direct view in the living room is becoming more desired, as its fixed position offers opportunities for its use above in this way or for other purposes. Lattice panels, frames filled with reed or willow are swung on hinges between posts or front legs so that there is no fixed obstruction in getting to the radiator or valve. Fig.



Fig. 9—Built-in Feature for the Kitchen

8 is a frame filled with ⅜-in. dowels set one inch apart, the frame, hung from the front apron, swinging 5 in. from the floor.

On the supposition of more space being desired in a home there are two rooms frequently adjoining, one of which possibly is a little larger than the other, where alteration may bring about greater convenience and certainly much more storing space, provided, of course, the built-in addition supplants some of the former movable furniture.

By removing the plaster and lath from both sides of intervening room a plan of alternating casement could be effected retaining the studding as divisions or in one or more intervals removing a studding for wider compartment, in this event putting in a heading. Set out from the face of the studding, on both sides, a width of, say, 8 in. or 10 in., and let this be the frontage of each room's compartments, building to a supporting heading cornice and apron under the ceiling, all conforming to the trim of the house. We then have the two rooms divided, or shall we say, robbed, of 20 in. or 25 in. of space, rather than the customary 5 in. or 6 in. of wall space. This might appear great trespass on an al-

ready small room, but with the elimination of some of the portable pieces of furniture the built-in enclosure will provide space for the same conveniences. Thus a dresser in one room could alternate with a similar dresser in an adjoining room; likewise a wardrobe with very ample room to ceiling height, if desired, could alternate the full width, while book shelves within this width could be placed back to back. Should the position of such alteration be within easy pipe extension, a lavatory could be set in with mirror above and under the upper casement shelving. The lavatory of the adjoining room would be recessed in like manner with the same line of pipe and outlet.

While this is somewhat of a battery idea of conveniences, or system of units, its development and treatment need not be monotonous or one sided. Undoubtedly much nervousness and irritation in housekeeping could be avoided should the builder consider concentration plans along such a method of space utilization, even though a Pullman car step-ladder be used infrequently to get things from upper compartments.

The kitchen should be the room where built-in conveniences permit of the greatest freedom of floor space and access to every article of use. Even a swing-under stool may take the place of a chair, and with closed drawers and doors the room is ever ready for mopping and scrubbing. Fig. 9 may suggest modifications to meet individual needs. As will be seen, a preparatory spacing similar to store shelving is arranged and certain portions and divisions protected by framed glass doors, while the under compartments holding pottery and pans are screened and protected by solid doors.

What might be unused space under some back kitchen stairs is utilized for heavy kitchen ware by setting them in a box carrier on wheels, as shown in Fix. 10.

Fig. 11 is a most convenient cornerpiece for seat and telephone service, and may be made portable, as shown, or a modified form built in to the corner where needed.

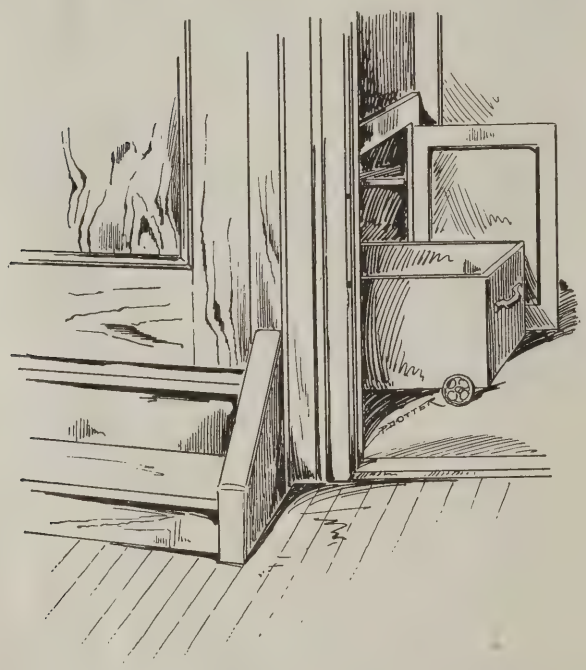


Fig. 10—Showing Box Carrier on Wheels

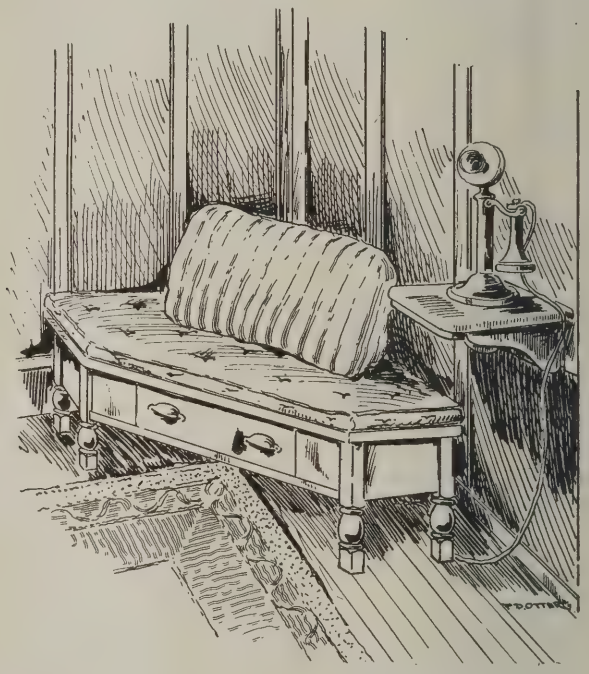


Fig. 11—Corner Seat with Handy Telephone Bracket

MAMMOTH COLD STORAGE BUILDING

Plans have been prepared and contracts awarded for what will be the largest cold storage warehouse ever constructed in this city if not in the country, the capacity being placed at 8,700,000 cu. ft., and involving an estimated outlay of more than $2,000,000. The building will cover an area of approximately 200 x 330 ft., will be eleven stories in height and will have about 700,000 sq. ft. of floor space.

Some idea of the magnitude of the structure may be gained from the fact that approximately 30,000 yd. of gravel, 20,000 yd. of sand, 60,000 bbl. of cement, 3,000,000 bricks, 1,000,000 ft. of lumber, and 1500 tons of reinforcing steel will be required. The building will be of fireproof construction designed according to the requirements of the New York Fire Insurance Exchange and will be equipped with sprinklers, all of which will make possible a very low insurance rate both on the building and on the merchandise stored.

The huge warehouse will cover the entire block bounded by Sixteenth and Seventeenth Streets, Tenth Avenue and Marginal Street, New York City, and will be erected by the Turner Construction Company, in accordance with plans prepared by J. B. Snook & Sons.

HOUSE SHOWN ON OUR COLORED COVER

AN EXTERIOR OF STUCCO ON METAL LATH WITH ROOF OF ASBESTOS SHINGLES

WE have taken as the subject of our colored cover design this month a country house of stucco exterior and providing nine rooms, of which four are on the main floor and five with bath room are on the second floor. The architect has designed the building for a plot of ground having a frontage of 75 ft. or 100 ft. and has planned for a family of four people, with a guest room and also a room for a servant.

LAYOUT OF ROOMS

A study of the floor plans presented upon the following page shows the entrance to be through a vestibule which opens into a small hall, at the right and left of which are living room and dining room. It will be seen that the living room extends the full depth of the house, is well lighted with double windows at each end, and has two large double casement doors opening on to the porch extending across that end of the building. The open fireplace is a noticeable feature of the living room, and is built of tapestry brick. The stairways are located in the center of the house, the flight to the cellar being under the main stairs leading to the second story. In the rear of the stairs is a small library, which could also be used as an office if such a scheme should seem to be desirable.

The dining room at the left of the main hall is practically square in plan, and contains a built-in buffet located under a double window. Communication with the kitchen is established through a commodious pantry containing two closets and space for a refrigerator. The pantry also communicates with the hall, and is conveniently placed as regards the cellar stairs. The kitchen is 12 x 13 ft. in size and contains a sink placed under a double window, where ample light is provided, and has two large closets for kitchen utensils, etc. The entrance to the kitchen from the rear is by means of a small porch. The laundry is located in the cellar directly under the kitchen.

THE SECOND FLOOR

The sleeping rooms on the second floor are 8 ft. in the clear, are amply lighted and ventilated, the latter being greatly facilitated by transoms over all doors. The bath room is at the rear of the house, but convenient to all sleeping rooms, and is equipped with wash basin, water closet, bathtub and medicine cabinet. In a corresponding position at the front of the house is a sewing room which, it may be pointed out, can also be used as a child's room if required.

According to the specifications of the architect, the foundation walls are to be of concrete 8 in. thick, supported on footings of concrete 10 in. thick and extending 6 in. each side of the wall above. All concrete is to be mixed in the proportion of one of cement to three of sand and five of broken stones. It is pointed out that in places where the ground is damp, hollow concrete blocks serve a good purpose for foundation walls.

The framing timbers are to be of spruce, with corner posts 4 x 6 in., girders 4 x 8 in., plate 4 x 6 in. laid flat, first floor beams 2 x 10 in. and the second floor beams 2 x 8 in., the floor beams being placed 16 in. on centers and strengthened with rows of cross bridging placed about 6 ft. apart. The studs are to be 2 x 4 in., placed 16 in. on centers and doubled at all openings. The attic floor beams, also the rafters of the main roof are to be 2 x 8 in., all placed 20 in. on centers. The porch ceiling beams are to be 2 x 4 in. and floor beams 2 x 6 in., all placed 16 in. on centers.

THE EXTERIOR COVERING

The entire exterior frame of the building is to be covered with 1 x 9-in. hemlock sheathing laid diagonally, over which is to be placed a layer of good building paper. This in turn is to receive 1 x 2-in. furring strips placed 12 in. on centers, and to these strips is to be nailed the metal lath to which the stucco is to be applied.

The exterior stucco is to be two-coat work, the scratch coat to be at least a half-inch thick outside of the lath surface. It is to consist of one part cement, three parts sand and not more than 10 per cent lime putty. The first coat is to be applied under pressure, and must be well scratched before it sets. The finish coat is to be at least ¼-in. thick, and to consist of one part cement, two parts clear, sharp sand, and three parts pebbles for rough finish. The stucco is to be given a cream tint.

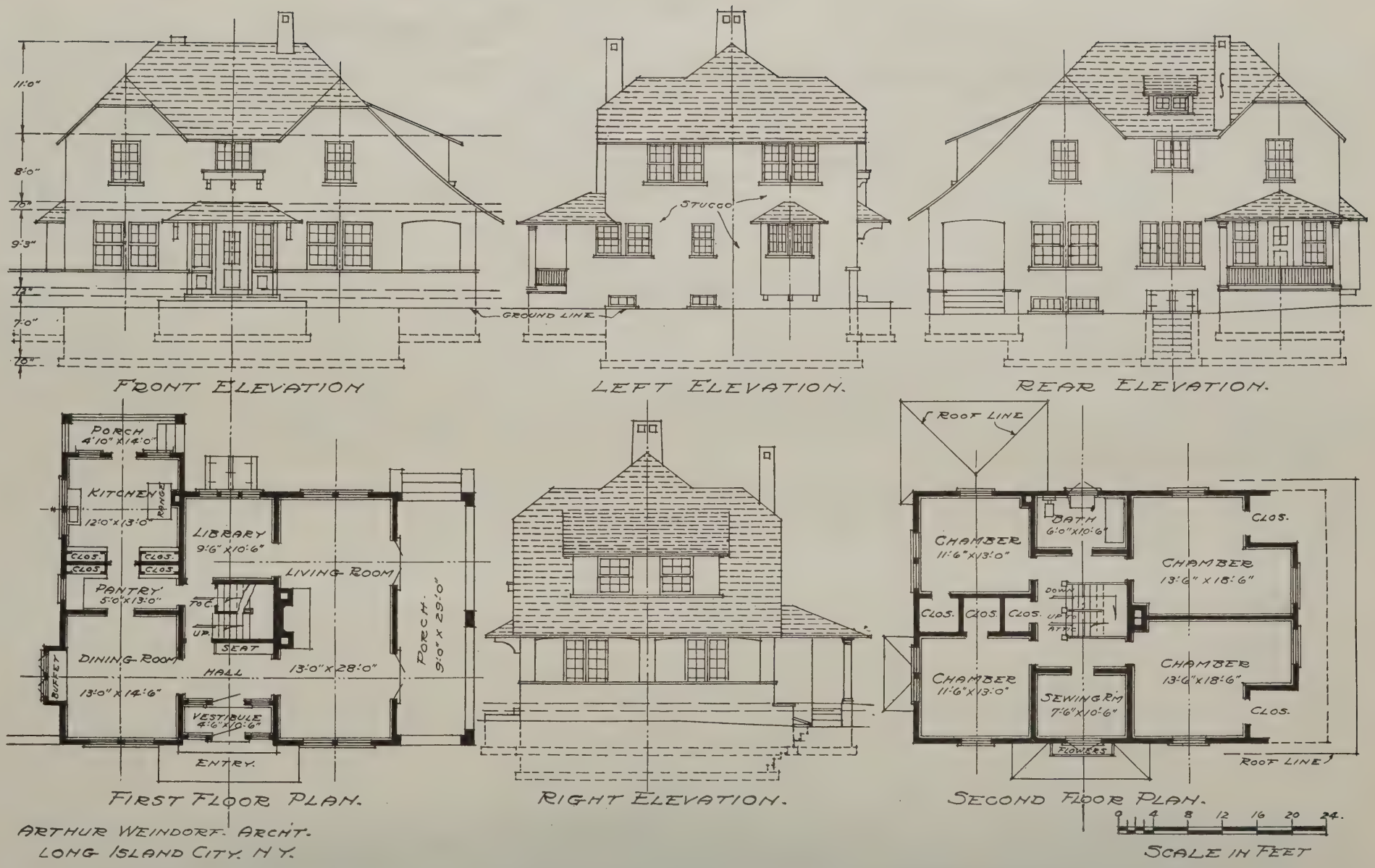
The area of the roof is to be covered with asbestos shingles and are to be laid with an exposure of 5 in. to the weather.

The chimneys are to be constructed of hard burnt brick. The kitchen chimney is to have one flue and the living room chimney two flues, to be lined with vitrified flue lining. Above the roof line the chimneys are to be finished with stucco.

FLOORS AND TRIM

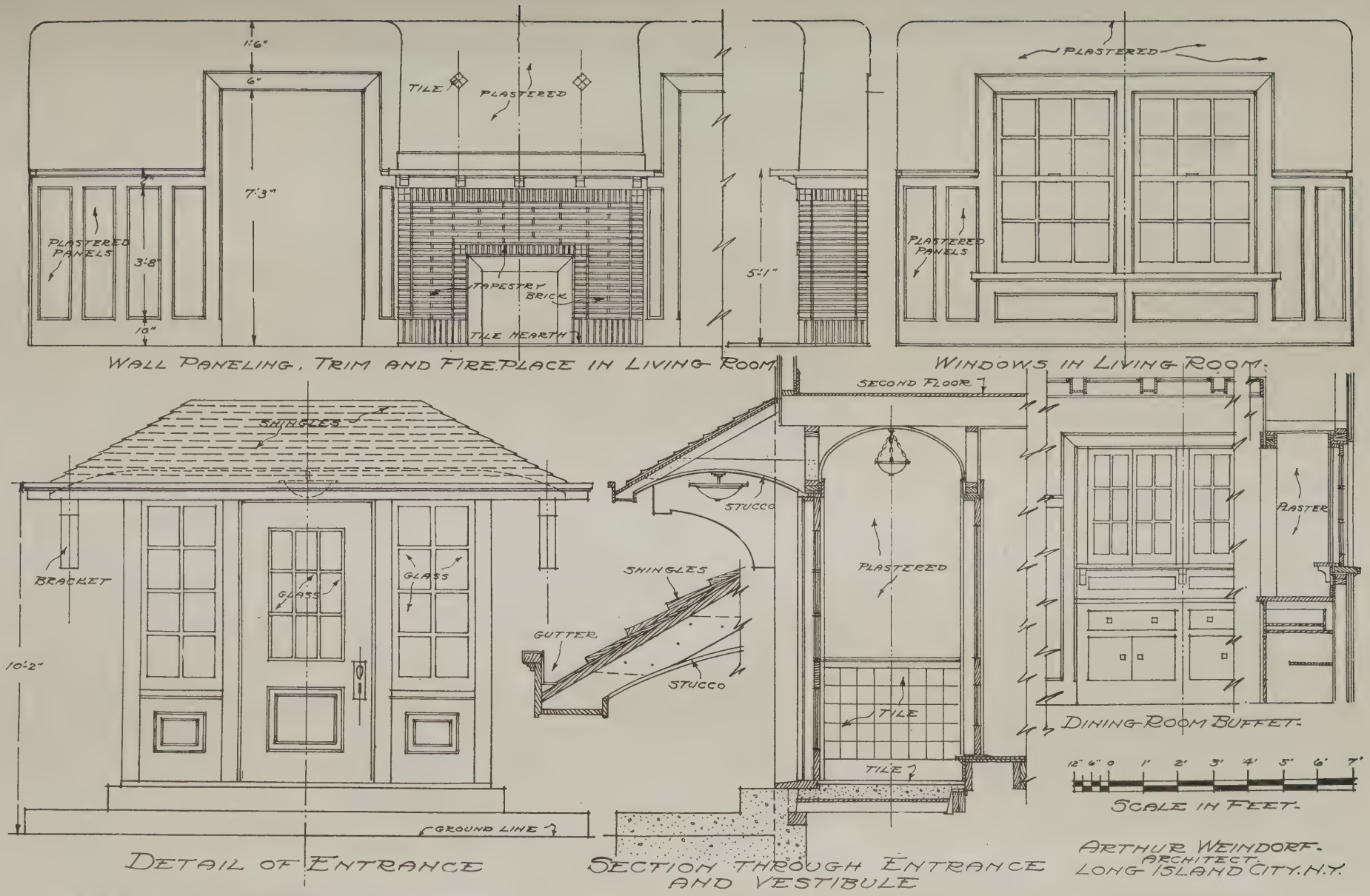
Exterior cornice, rails, brackets, trim, etc., are to be of white pine. The floors are to be double on the first tier of beams, the under-floor to be of 1x6-in. tongued and grooved pine, while the finish floors in the living room, dining room and library are to be of ⅞x2½-in. maple. All other rooms are to have ⅞x4-in. North Carolina pine floors.

The interior trim throughout the house is to be fir for the living room, dining room and the library.



ARTHUR WEINDORF. ARCH'T.
LONG ISLAND CITY. N.Y.

PLANS AND ELEVATIONS OF THE STUCCO-COATED COUNTRY HOUSE SHOWN ON THE COVER OF THIS ISSUE OF THIS PAPER



MISCELLANEOUS CONSTRUCTIVE DETAILS OF THE COUNTRY HOUSE SHOWN ON THE COVER OF THIS ISSUE OF THIS PAPER

All other rooms are to have white wood trim. All bed-room doors are to be birch veneered.

The trim in the library, living room and dining room is to be brought to a smooth finish, filled with a good wood filler and stained and varnished, the colors to be selected by the owner. All trim in the bed rooms is to be enameled and the doors stained mahogany. The walls of all bed rooms are to be tinted with waterproof paint flat finish with neat borders stenciled on. The bath room, kitchen and pantry walls are to be enameled to within 4 ft. of the floor, and over this space is to be laid oil cloth wall covering with tile effect. The walls of library, living room and dining room are to be treated with waterproof paint with flat sand finish.

The walls and ceilings of all rooms are to be plastered two coats applied to spruce lath, and all rooms except the library, living room and the dining room are to have a hard, smooth finish.

The floors are to be filled and varnished, the maple flooring to have an additional coat of wax.

All exterior trim is to be given three coats of white lead and linseed oil paint, and all sheet metal work is to be painted on both sides before it is laid. All leaders are to be of galvanized iron of neat square design.

The hardware is to be of a neat bronze plate finish and match the lighting fixtures in design. All knobs for bedroom doors and closets are to be glass.

The lighting is to be by means of electricity. The living room is to have two drop pendants of two lights each and the dining room is to have one drop pendant of two lights each, all of which are to be of the indirect lighting type. All other rooms are to have two lights.

THE PLUMBING

A good system of plumbing is to be installed with simple fixtures using a galvanized iron sink and a two-part wash tray in the laundry and an iron enameled sink and a 40-gal. galvanized iron hot water boiler in the kitchen. All rough pipes are to be given a coat of enameled paint and all plumbing work is to be exposed. The plumbing in the bath room is to be of the open type with an iron enameled bath tub, water closet with china bowl and low tank, and wash stand of one-piece enameled iron. All supply cocks and exposed pipes are to be nickel-plated.

The house is to be heated by means of hot-air with registers in all rooms except the kitchen. The installation is to be such as to properly heat all rooms to 70 deg. in zero weather.

According to the architect, the cubical content of the house here shown is 37,995 cu. ft., on which he places a unit cost of 22c per cubic foot. This figure, however, does not include the contractor's 10 per cent profit. Owing to the labor conditions and high cost of materials in various parts of the country, these figures will vary from 5 per cent to 20 per cent, according to locality and style of finish.

The country house here illustrated and described was designed by Architect Arthur Weindorf, Long Island City, N. Y., or care of The Building Age, 50 Union Square, New York City.

OFFICERS OF WHITE CEDAR SHINGLE MANUFACTURERS' ASSOCIATION

The annual meeting of the Northern White Cedar Shingle Manufacturers' Association was held in Milwaukee, Wis., on Jan. 27, and the following officers were elected:

President....E. A. Hamar, of Chassell, Mich.
First Vice-Pres...W. A. Holt, of Oconto, Wis.
Second Vice-Pres. .....
John E. Kelley, of Sault Ste. Marie, Mich.
Secretary.....O. T. Swan, of Oshkosh, Wis.
Treasurer....A. C. Wells, of Menominee, Mich.

Officers of the association, the headquarters of which are in Oshkosh, Wis., have made a comparative analysis of 100 samples of composition roofing and together with facts on wooden shingles, and have presented them to municipal authorities contemplating ordinances covering roof construction.

OHIO STATE ASSOCIATION OF CONTRACTORS

The Ohio State Association of Contractors has been formed with a membership of 200, and the organization is to be incorporated and state headquarters will be opened in Columbus in charge of a secretary-treasurer, who, with the legal department, will operate the organization. Officers have been elected as follows:

President....H. E. Culbertson, of Cleveland
Vice-Pres.....William Graham, of Columbus
General Counsel.....William E. Minshall of East Cleveland

The purpose of the organization, as stated in the articles of incorporation, will be to obtain uniform contracts, specifications and methods for contracting, develop friendly relations among contractors and do educational work with members and the public in all matters pertaining to contracting.

OFFICERS OF HARDWOOD MANUFACTURERS' ASSOCIATION

At the annual convention of the Hardwood Manufacturers' Association of the United States, held in Cincinnati, Ohio, from Jan. 30 to 31, officers were elected as follows:

President..B. B. Burns, of Huntington, W. Va.
First Vice-Pres...F. R. Gadd, of Chicago, Ill.
Second Vice-Pres.....E. O. Robinson, of Cincinnati, Ohio.
Treasurer..M. W. Stark, of St. Albans, W. Va.

About 400 delegates were in attendance, and a number of interesting addresses were made.

The architects of Stockton, Cal., have organized, and with the support of the city council have started work on a proposed building code.

MOVING A BUILDING UNDER DIFFICULTIES

RAISING A 2800 TON BRICK BUILDING AND MOVING IT OVER "MADE" GROUND

IN order to make room for the mammoth new building which is to be erected in San Francisco for the offices and executive departments of the Southern Pacific Railroad Company, it was necessary to remove from the site the Buckley Building, a brick structure measuring in plan 46 ft. 6 in. by 137 ft. 6 in. and three stories in height. One side and one end were solid brick while the remainder of the building was of steel frame with curtain walls of brick and having concrete floors. The estimated weight of the building was 2800 tons, the reason for the enormous weight being the heavy steel framework and the walls which were 2 ft. thick, the original intention having been to erect a six-story building, but when three stories had been completed it was found that the foundations would not carry any more.

This notable moving operation was complicated in many ways owing to the fact that it had to be moved over "made" ground consisting of black mud 50 ft. deep. The engineers expressed a doubt as to the feasibility of moving a brick structure as heavy as the Buckley Building over filled ground, but the house-moving contractor in charge of the work explained how it could be accomplished.

Every 12 ft. he drove a pile to a depth of 120 ft., then covered the ground horizontally with 7 x 10 in. ties, the surface being flush with the tops of the piles. It was then crossed with 12 x 12 in. beams placed 3 ft. on centers except where the piles occurred and there it was crossed with 12 x 16 in. timbers on top of the piles, then 12 x 12 in. timbers were laid horizontally again for the tracks, there being three for each track and covered with hardwood 2 in. thick.

The settlement of the track after the building moved over was only ⅜ of an inch. The plate glass in the building was left in place and the moving was done without damage to it or even cracking the plaster.

The pulling gear consisted of two main falls, one on each side of four sheaves, with 1¼-in. nickel steel rope 800 ft. long and a three-sheave luff on each fall of ⅞-in. timber wire rope 1000 ft. long. The ends of the two luffs were brought together and clamped and then an idler sheave was put on the bight and a three-sheave luff on that sheave of ¾-in. wire rope 1500 ft. long. The pulling was done by means of a donkey engine and averaged about 25 ft. per day.

The building was moved a distance of 150 ft. and it required the services of a crew of fifteen men for a period of ten weeks. In the moving of the build



FIG. 1—THE TIMBER WORK AND SCREWS AROUND ONE OF THE CENTER COLUMNS OF THE BUILDING READY FOR LIFTING

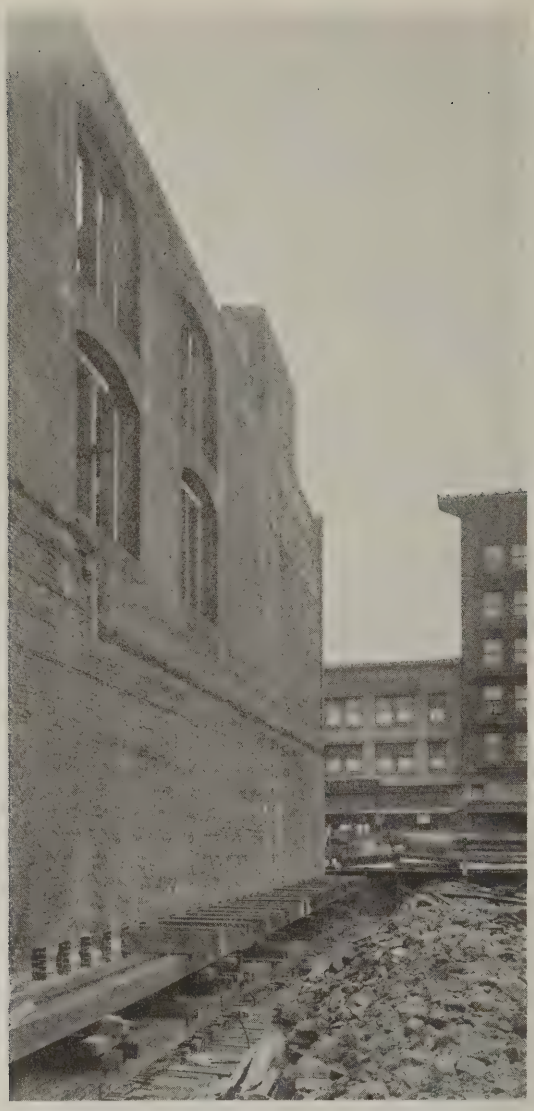


FIG. 2—SIDE VIEW SHOWING HEIGHT OF THE BUILDING TO BE MOVED

ing 265,000 ft. of 12 x 12 in. pine were used, 14,000 ties 7 x 10 in. in cross-section and 8 ft. in length, 50,000 cedar shingles, 200 steel jackscrews, 400 laurel rolls 8 in. in diameter and 4 ft. long, and 10,000 ft. of 2 x 8 in. hardwood.

In Fig. 1 the timber work and jackscrews are shown in position near one of the center columns of the building and everything is ready for the lifting. Fig. 2 represents a side view showing the height of the structure and with some of the needles in place. Fig. 3 shows side and rear views of the building, while Fig. 4 is an underneath view showing the first stage of the loading. In Fig. 5 the timbers are all in place and the screws set for lifting. The screws are set around an outside column of which there were eighteen in all. There were nine on the face of the building and nine through the center.

The house-moving engineer in charge of the work was Theo. L. Hunt of 1371 Forty-fifth Avenue, San Francisco, Cal., who, it will be recalled, was in charge of the moving a few years ago of the Commercial High School Building in that city, a description of which appeared in these columns at the time. He also superintended the moving of the brick building for the government at Mare Island about a year ago and has superintended some of the most complicated house moving jobs in the city.

AVOIDING ERRORS IN ESTIMATING

One of the commonest causes of dispute between the retail lumberman and the customer who has just built a house is that the bill amounts to more than the estimated cost, says the *American Lumberman.* Very frequently this added cost is the result of some item being forgotten in the initial figuring of the house bill that had it been incorporated in the beginning, would not have caused the slightest



FIG. 3—SIDE AND REAR VIEWS OF BUILDING SHOWING NEEDLES IN PLACE READY TO BEGIN LIFTING OPERATIONS



FIG. 4—AN UNDERNEATH VIEW SHOWING THE FIRST STAGE OF THE LOADING

trouble. In almost all cases of this kind customers seem to think that the retailer is trying to "put something over," and raise so much objection that many a lumberman has suffered a considerable loss rather than run the risk of losing a good customer.

It is the duty of the architect to prepare a list of materials, but only too frequently there is no architect in the smaller towns and the local lumberman has to serve in his stead and do the estimating. With the progress of retailing lumber this is becoming increasingly necessary in the largest and smallest towns alike.

An estimate book that lists in detail all of the items that ordinarily go into the construction of a wooden house will be found to be of great help to retail lumbermen as a sort of a "mechanical



FIG. 5—THE TIMBERS IN PLACE AND THE JACK SCREWS SET FOR LIFTING THE BUILDING

memory," and may save time, money and friends if applied conscientiously.

It is a good plan to provide several types of books for buildings of different kinds; say one for houses of the two-story type, one for barns and one for buildings of small size. The initial cost will be small as compared to the saving to the lumberman, as their use will enable the estimate to be made with greater speed and allow him to rest assured that nothing has been forgotten in the estimate.

The following gives an idea of the form that is desirable for a two-story house, the list to be tabulated, giving number of pieces, their size and lengths:

Framing—Sills; cellar posts; first floor joists; first floor bottom plates; first floor outside wall studs; first floor partition studs; first floor top plates; first floor porch joists; first floor porch plates; first floor porch studs; first floor porch top studs; second floor joists; second floor bottom plates; second floor studs; second floor partition studs; second floor top plates; ceiling joists; ceiling rafters; second floor porch joists; second floor bottom porch plates; second floor studs; second floor top plates; ceiling joists; ceiling rafters; joist bracing for all floors; bracing for roof rafters.

Outside Sheathing—Sheathing; building paper; siding; roof sheeting; building paper (where used); shingles; sheeting under eaves (D & M or ceiling).

Floors—First floor subfloor; building paper; flooring; porch subfloor; flooring; second story subfloor; building paper; flooring; second story porch subfloor; second story porch floor.

Stairs—Porch stair horses; risers; stepping; molding; stair horses to second floor; risers; stepping; molding; railing; pickets.

Lath and Plaster—Lath; plaster (hair or wood fiber).

Interior Finish—Base molding; picture molding; floor molding; plate rail; mantel; shelving for closets; material for any special built-in features such as bookcases.

Exterior Finish—Water table; corner boards (or metal siding corners); ceiling for roof of porch first and second stories; molding to border ceiling; porch columns; cornice work; roof saddle boards (or metal ridge roll); material for outside beaming or brackets.

Mill Work—Inside doors; outside doors; transoms; outside door frames; inside door frames; door frame trim; thresholds; windows; window frames; transom frames; outside window trim; inside window trim; special items.

Hardware—Framing nails; sheeting nails; shingle nails; flooring nails; finishing nails; lathing nails; casing nails; door locks; window catches; pulleys; sash cord; sash weights; paint, hinges.

KOKOMO BUILDING CONTRACTORS' ASSOCIATION

The Building Contractors' Association is the name of an organization which has just been incorporated under the laws of the state at Kokomo, Ind. "to promote and protect the interest of the building contractors; to promote better relations between employers and employees and to arbitrate any differences which may arise between them." The officers chosen to serve for the ensuing year are:

President.....E. L. Danner
First Vice-Pres.....Charles E. Ferriter
Second Vice-Pres.....R. E. Dungan
Secretary.....O. F. McIntosh
Treasurer.....F. C. Folk

We understand that the new organization is formed under the Voluntary Association Act.

OFFICES OF NATIONAL ASSOCIATION OF BUILDERS' EXCHANGES

The headquarters of President R. K. Cochrane and Secretary E. M. Tate of the National Association of Builders' Exchanges have been established in the Builders' Exchange Rooms, 207 to 212 Fulton Building, Pittsburgh, Pa.

OFFICERS N. Y. STATE BUILDERS' ASSOCIATION

At the recent meeting of the New York State Association of Builders held in the rooms of the Builders' Association Exchange in Buffalo, officers were elected as follows:

President.....Edward A. Keeler, of Albany
First Vice-Pres.....G. C. Schierer, of Buffalo
Second Vice-Pres. F. C. Youngs, of N. Y. City
Secretary-Treas...James M. Carter, of Buffalo

The delegates were the guests one evening of the Buffalo Exchange, a banquet being tendered them at the Iroquois Hotel in celebration of the fiftieth anniversary of the Buffalo organization. The entire evening was devoted to entertainment and social good fellowship, speech making being entirely eliminated from the program.

AN UNBREAKABLE WINDOW GLASS

A new glass, transparent, tough and strong, which a 22-caliber bullet cannot penetrate and a brick cannot shatter, is stated by *Popular Science Monthly* to have recently been invented. The secret of its strength is said to be a sheet of white, transparent celluloid, twenty one-thousandths of an inch thick, placed between two pieces of glass. The glass and celluloid are welded together under high temperature and tremendous pressure, the result being a solid sheet possessing the transparency of the best plate glass and the strength of a sheet of metal.

The next annual meeting of the National Fire Protection Association, Boston, Mass., will be held in the city of Washington, D. C., on May 8 to 10 inclusive.

SOME "KINKS" FROM A CARPENTER'S DIARY

A FEW PRACTICAL COMMENTS ON A DIVERSITY OF TOPICS OF SPECIAL INTEREST TO THE CRAFT

By HAMMER AND SAW



LL work should be worked on the face side," said the Boss to me one day as he watched me saw a board that I was about to nail. This little advice I shall never forget, for it applies to all good work and especially to finishing.

One of my initial experiences in carpentry work was on a veranda job. The sides were shingled—part plain and the rest octagon shape to conform with the gable end of the house, consequently had to be sized. The foreman handed me an old-fashioned scribing gauge and showed me what he wanted done. Down in the cellar he fastened a plank to the wall, set the gauge, tacked a shingle to the plank and drew the gauge across until it cut through—a very simple operation. About seven bunches of shingles were required for the job. In the first hour's work I wore the hide off the ends of my fingers; in two hours my temper was worn to a frazzle; then came a happy inspiration. I got out my 45 plane, which has a slitting cutter attachment, set the fence right, nailed a pine strip on the plank for a shingle stop and guide and did the work much easier in quarter the time than with the gauge. One of these little planes is almost indispensable to the carpenter.

Once I was acquainted with an old gentleman seventy years of age, and his given name was Philander, but the Boss always called him "Phy;" while some of the boys called him "Old Crab." He was short and thin and kind of weazened up; about the biggest part of him was his long whiskers. In his day he had worked in twenty States and was a fine finisher, yet for all his experience he seemed to lack confidence in himself, for he never could plan or lay out work to any extent, so the Boss said. He lacked executive ability, his eyes were not the best and he was awfully nervous. He was a strict Baptist, and every Sunday dressed in a slightly faded black suit. "Phy" had two forms of dissipation—that of swearing when excited and chewing tobacco. The first was quite amusing to other workmen, who would often stop and listen. One day he stood on a step ladder putting on base and molding around a balcony in a church. Accidentally the step ladder toppled over, leaving him hanging suspended 8 ft. from the floor. He commenced to kick and holler, and for a few minutes the atmosphere was blue. The Boss and the entire gang rushed into the room, and the Boss said, "What's the matter, 'Phy?'" "Matter?" replied "Phy," "a man would die around here before he could make anybody hear." After we helped him down we sneaked around the partition and put our hands over our mouths.

Another time, on a repair job, we needed a ladder. No one seemed to want to walk a mile to the shop for one, so a helper threw one together out of 2 x 4 scantlings. "Phy" used this ladder very cautiously, and every time he placed his foot on it he would give it a dubious look and remark, "That ladder would shake a squirrel off it."

When it comes to staging a building we've got to hand it to the old-timers, after just escaping several serious falls due to carelessly built stagings. I've given this more importance than formerly, and have come to the conclusion that staging can't be built too safe, and I have always felt safe when working on a staging built by these old timers.



Fig. 1—How Warped Studding Were Made Straight

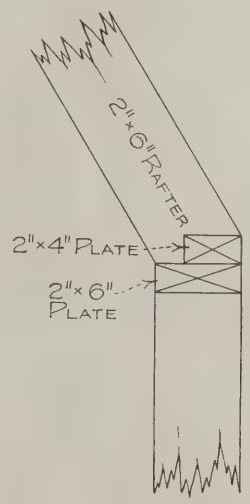


Fig. 2—Making a Shoulder on the Seat Line to Prevent Slipping When Raising

How often it happens that occasions arise where shingling has to be done on curved surfaces such as porches or the overhang on houses and barns. When shingles are dry it is a task to nail them on without splitting. Much time is consumed in trying to do this, but by thoroughly soaking them in water this trouble can be avoided.

Once I was at work with this in remodeling a house built more than one hundred years ago. The sills were 12 x 12 and hewn out, the plates 8 x 10, and the studs were 4 x 4, spaced 16 in. on centers and mortised into both plates and sills. The material was oak and ash and was as sound as the day the

house was built. The frame was sheathed to hemlock plank, over which was a layer of grass and this covered with the old-style clapboards the same thickness on both edges.

When we started ripping off these boards a million bats flew out. The boards were perfectly sound, so the owner had them placed on the studs as sheathing boards and covered them with modern drop siding. The clapboards were cucumber, and I thought the best material had been covered up.

Regarding the amount of work a man can do in a day, I am inclined to think that the question has never been accurately answered. The nature of the work, foreman, men and various elements connected with the work must be all taken into consideration. I have seen men who would do their best for a foreman they liked and hated to stop work at quitting time. These same men would dread the same work under a different foreman. To further illustrate this I would state that on a job helping build forms for a mason contractor the latter had a lot of field stone in small piles scattered around over fifty acres. The weather was hot; he hired three boys eighteen to twenty years old, who wanted to earn a little pin money during vacation. The foreman wanted these stones used in the foundation, so he set the three boys wheeling stones for the masons. For four days they did fine work, then they began to lag behind; did not keep up with the masons. Some men would have tried to ball them out, but this one had a grain of common sense. Friday morning the boys' minds were elsewhere than wheeling stones, for snatches of their conversation were of a picnic which was to occur the next day. Noticing this, the foreman called them aside and said:

"See here boys, I want that stone here to-morrow. From now on the one who wheels the most loads gets a dollar extra, and if it's all here at noon to-morrow you get a half day off with full pay."

The three lads promptly commenced to ginger up. They had an incentive for working besides their mere wages; that is encouragement. At three o'clock the next day the stone was all wheeled, and I have never seen three happier lads start for a picnic. This foreman was slightly different from the man who would not consider building on a corner lot and offered a hundred reasons why. I never knew there were so many until that man had cited them all, but in this old world some of its inhabitants must be the corner lot builders and stone wheelers. When I hear a pessimist rave I often think of the lines:

"When the burden bearers come along each day,
Why not a smile, a cheery word to lighten their labors along the way?"

One time when partitions were ready to be set we ran short of studding. What we had were badly warped, for all the straight ones had been used. This will often happen if proper precaution is not taken and the straightest sorted out for headers and trimmers around openings. The job was in the country quite a distance from any lumber yard, and rather than knock off work for the day we straightened and used some of the pieces by saw kerfing one edge 1 in. to 2 in. and inserted a little wedge in the manner shown in Fig. 1 of the sketches.

Recently when cutting the lower set of rafters for a gambrel roof barn, I wanted a shoulder on the seat line to prevent slipping when raising. As the rafters and plates were 2 x 6 in. stock, the rafters were not wide enough to do this, so I spiked a 2 x 4 for the top plate and cut the rafters as shown in Fig. 2.

MASTER BUILDERS' ASSOCIATION OF PASSAIC AND VICINITY

Representative builders of Passaic, Rutherford, Garfield, Nutley, Clifton, Wallington and Lodi held a meeting a few days ago at the Board of Trade rooms, Passaic, N. J., and formed a Master Builders' Association with the following officers:

President.....Adrian Zandee
Vice-President.....Albert Martin, Jr.
Secretary.....Thomas A. Hopkins
Treasurer.....John Berridge

Various committees were appointed, among them being one on by-laws. Brief addresses were made by J. P. Christofferson, secretary of the State Master Builders' Association, and by John J. Kelly, of the National Contractors' Association of Harrisburg, Pa., who explained the workings of the organization which he represented, and after his remarks were concluded, the local body decided to become affiliated with the National Association.

MEETING OF SOUTHERN CALIFORNIA MATERIAL MEN

The Annual Meeting and Banquet of the Los Angeles Building Material Dealers' Credit Association was held at Los Angeles the first week in February. Talks were made by Robert Bostwick, the new president, H. B. Potter, the retiring president, S. L. Weaver and George L. Morris.

Plans were discussed for the proposed big down town office building to be erected by the Association to provide quarters for the Association itself and for such of its members as desire to secure offices in it. The idea of having the building constructed of home products exclusively was widely favored, and it is understood that this will be done.

OFFICERS OF NEW YORK MASTER PAINTERS' ASSOCIATION

At the recent convention of the New York State Association of Master Painters and Decorators held in Rochester, the following officers were elected to serve for the ensuing year:

President.....Oscar L. Wood, of Syracuse
Vice-President.....Fred C. Glunz, of Buffalo
Secretary-Treas...Carl Goeddertz, of Rochester

Nine members were elected to the Executive Board and trustees were chosen for two and for three years respectively.

LAYING SLATE AND COMPOSITION SHINGLES

TOOLS REQUIRED FOR THE PURPOSE—HOISTING THE SLATE—ROOF ORNAMENTATION

BY L. S. BONBRAKE

AS a result of a recent trip through the South, when calls were made on a number of tradesmen, I am disposed to offer a few comments on the subject indicated by the title of this article.

As there seemed to be on the part of the sheet metal men a lack of knowledge about the laying of such roofs, this article is written to help the trade, and though it is especially applicable to slate roofing, almost the same *"modus operandi"* will cover all such classes of roofing. The purpose is to give very plain descriptions, easily understood, and tell how to make all tools necessary at home.

Tools necessary on the roof are first a hatchet that may be made from any style that best suits the fancy. All that is needed to have hammer, puller, cutter and punch all in one, is to weld a steel point to the outer corner of the hatchet blade as shown in Fig. 1. A cutting stake may be made by welding a file shank in the center of bar iron ¼ x 1¼ and about 14 in. long, as shown in Fig. 2. A slate to be cut is laid on the stake and the hatchet or edge of the ripper used to cut off the corner or cut it down as may be required. For repair work or removing cracked or broken shingles a ripper, as shown in Fig. 3, is very convenient and almost indispensable. It may be made from the long leaf of an old carriage spring, with the thin end split and turned as shown, and then sharpened all around, inside and outside of the curves on the end. These tools may be had in perfect make from any dealer in roofing supplies at a reasonable price.

A roof bracket can be made from short sawed off pieces of board found laying around almost any building in construction. The 2-in. wide extension strip of No. 26 galvanized iron shown in Fig. 4 may be shingled over and when brackets are to be removed the strip may be cut off close to bracket or may be broken off close to the butt of shingle by a few sharp bends. The pitch of the bracket is made to conform to the pitch of roof by the length of upright piece B. This may be made of 1-in. waste in any width and of 6 or 8 in. length for convenience.

A machine or gig that may be easily handled and hauled from place to place, for punching nail holes, especially in slate, is a great convenience, and knowing its value, a simplified form of one of my own construction is given. I have never seen one like it elsewhere. It is shown in Fig. 5, and described so that the advantage of its use may be derived by those who desire to make one. The frame is hard wood, 2-in. material, with the connecting joints mortised. The bed may be 20 x 24 in., adapted for using the larger size slate as well as the smaller. It should be 28 in. in height for work standing up. If it is desired to work seated the corner posts are of course shorter. This is adjusted to suit the person who is to use the machine. Running through the center lengthwise of the 2-in. hardwood top, the slot *A* will be noted, into which a bolt is inserted, first passing through the plate gage *B* for the purpose of adjusting the location of nail hole lengthwise of the slate. At the front it will be observed there is a groove made to engage the die *D*, which is shown more clearly enlarged at the right in *E*. This die is to give side adjustment to nail holes and may be clamped in position by means of set screw *F* at its side on the front.

At the back two ⅜-in. eyelets *GG* are bolted through the wood frame to engage a ½-in. rod leading from side to side and bolted to the top iron frame *H* at each end. The sides and front of frame *H* is made of ¼ x 1¼ bar iron. The rod at the back connecting same, by passing through the eye *G G*, forms a hinge, providing an easy and steady working up and down movement of the drive frame *H*. Engaging the front of the frame will be noted two

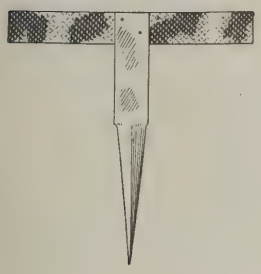


Fig. 2—Slaters' Cutting Stake

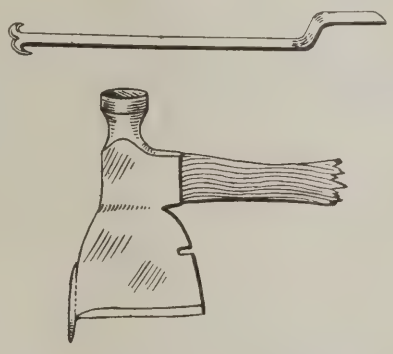


Fig. 3 (Top)—Slaters' Ripper
Fig. 1 (Bottom)—Slaters' Hatchet

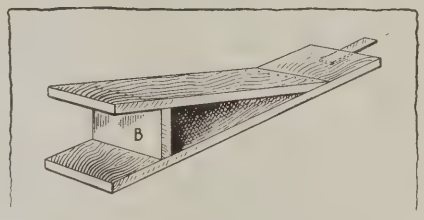


Fig. 4—Slaters' Roof Bracket

clamps, or punches, enlarged at right *I*. The set screw through its top will fasten it rigidly upon the front of the iron frame, which becomes a sliding bar on which they can be moved. The lower clamp *J*, at the right, is provided with a gage so that all holes may be punched uniformly and at the proper point.

The lap of the slate or other shingles or surface exposed on a roof to the weather depends upon their length. A usual and good size shingle for dwellings, especially in slate, is 10 x 20 in. This size will lay 8½ in. exposed, making the third under lap 3 in., which is allowed by all slate dealers, and enough slate shipped for a square to cover this lap allowance. A square in roofing is 100 sq. ft., and a square of slate is enough to cover that amount of space and include the laps. Using 10 x 20-in. slate, the roof is started by laying a course at the eave the full length of the building, having its outer edge raised ¼ in. higher than the level of the sheeting by laying a lath along the eave or having the fascia board extend up that distance. After the bottom course of slate has been laid, place the first slate *X*, Fig. 6, in position exactly above the center of the two slate in the first course, or over the crack between them. This will give 5 in. at each side. Fill in the space at the gable end with half slate *O* and continue laying slate to valley. This centers all seams as they should be.

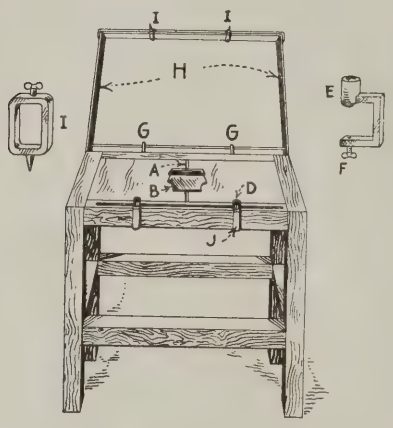


Fig. 5—Slate Punching Table

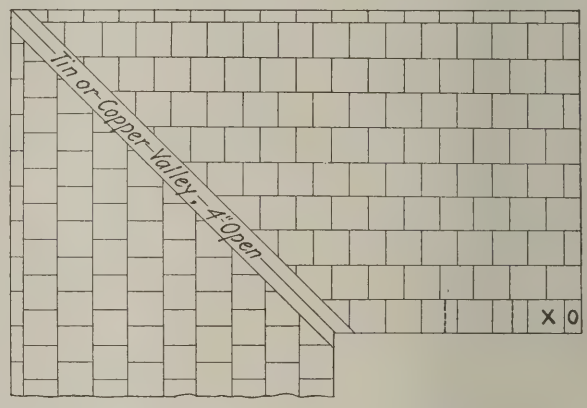


Fig. 6—Starting a Slate Roof at Eaves

Do not use 14-in. tin for valley unless the pitch is fully one-third. Tin 20 in. wide costs but little more, and there is the advantage of knowing there will be no leaks from capillary attraction. Using the size slate designated the first and second rows up the roof will have to be punched for nails on the roof by hand, the first row 10½ in. from the front end, the second 13½ in. This will give a longer underlap for the third row. However, after this course is straightened out the work can go ahead to the ridge with all the slate punched 8 in. from the back with the machine, which will allow ½ in. for nailing to miss under row and give 3-in. lap to the second slate, with 8½ in. exposed to the surface, as shown by side view, Fig. 7.

In slate roofing flashing is done in the usual manner for roof coverings of similar character, counter flashings being used for brick walls, etc. However, for chimneys, ventilators or other obstructions in the body of roof a water table is advised, extending well up the roof, also a division made in the center as shown by Fig. 11, which will throw the water each way, allowing none to stand. Space for free drainage should be given between slate and chimney.

Diamond-shaped slate is laid by lining for lap from the side. The roof and work is started by first laying the eave course of straight slate over which the diamond slate is started up the sheeting.

For hoisting slate or slate and asbestos composition shingles an outfit with which horse power may be used is shown in Fig. 8. A 2 x 4 studding is used for the extension with a hole convenient to the end to which the pulley may be attached. Several holes are made at short intervals forward from the center through which a bolt may pass to hold the side braces. The back end may be nailed. Near the end of the extension, at the eave, a platform is erected, large and strong enough for a man to stand upon and to hold a few hundred pounds of material, which may be pulled in as it comes up. A small chain with a hook at its end is more convenient for holding a bunch of slate than a box. A second pulley is attached to a stake driven securely into the ground, the rope passing through this pulley, continued on to a single tree to which the horse is hitched.

Another and good lift by hand in shown in Fig. 9. This has side standards with a bar through the center, upon which a large wheel may revolve, the wheel being after the style of a cistern chain pump wheel, although a pulley will answer. A strip is nailed across the top, and sides are braced, as at *B*, with the top of frame inclined forward. The top is held secure by a rope fastened at each corner, and passing back up the roof, shown by *C*, where it is fastened around a cleat, tied to a rafter or any safe way convenient.

The slate roof may be cut up into patterns of pleasing design and is demanded in various localities. To show how this may be done, Fig. 10 is

given, and as the design is original, it is not copyrighted, and may be used by any one. It has proven satisfactory in appearance, and may easily be modified or adjusted to large or small roof surfaces.

In slate and asbestos composition gray shingles are used for the body of the roof, with red (dark red) for design, and they give a pleasing effect, although the colors may be reversed if desired by the architect or owner. For slate roof there are unfading green shingles for the body and purple for the figures, which give pleasing results and satisfaction to all concerned.

In planning work to balance its finished appearance the roof must be measured to get full length of roof and rafters, including all projections. The roof shown in Fig. 10 has a ridge 34 ft. 4 in., the rafters and bottom projection to be 11 ft. 1 in.

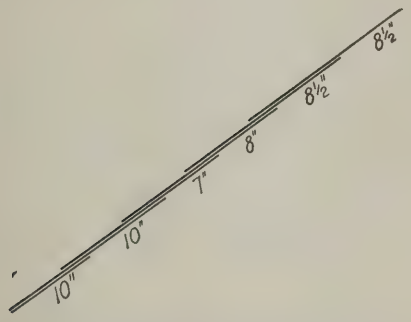


Fig. 7—Edge View of Roof Showing Laps

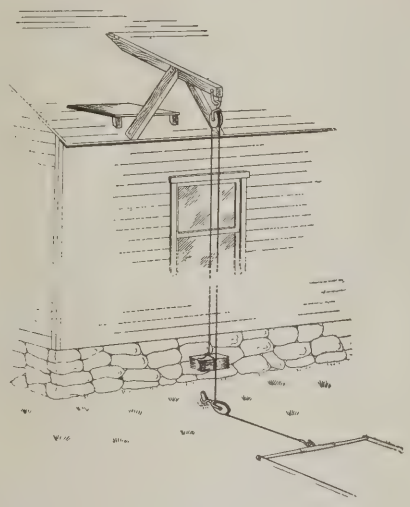


Fig. 8—Horse Derrick for Hoisting Slate

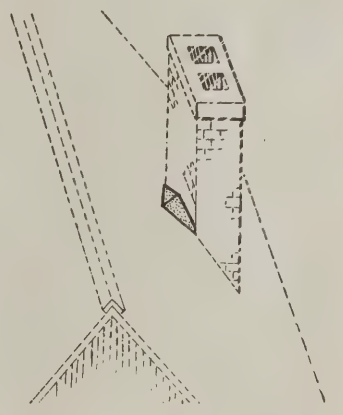


Fig. 11—Saddle Flashing

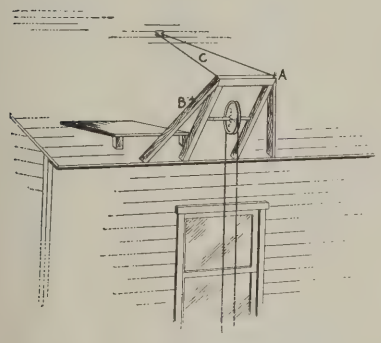


Fig. 9—Hand Derrick

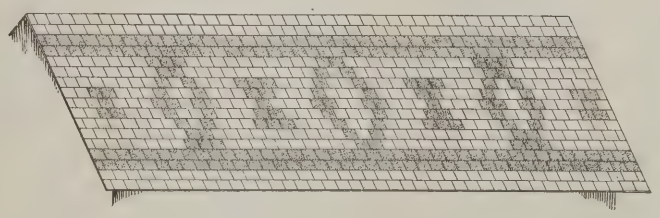


Fig. 10—Design for Ornamental Slate Roof

Using 10 x 20-in. slate, it is found that it will require forty-one slates from gable to gable. The roof is 412 in. long. Then forty-one slates 10 in. wide measure 410 in.

However, as the slate should not be jammed together, but rather a slight space for free drainage must be given to prevent water holding and freezing, the 2 in. will easily be gained in forty-one slates.

The length of the rafters is 143 in. As the first or bottom course is finished with only 7 in. of slate exposed, it leaves 136 in. to be disposed of at 8½ in. to the row, which gives 16 rows, or a total of 17.

Now the roofer can get the balance. The ninth row up the rafters is the center row, and the twenty-first slate from the end on that row is the center of the roof, and work may be directed from it in any direction. However, in the plan as shown, two rows of body slate are first laid, followed by two rows of colored slate. On the first row after the color row six body slates are laid, then three of color, or if so much color is not wanted, these slates may be left out at both top and bottom and each side of the central figure, also the three slates at the top and bottom of small central blocks may be omitted, making them the same as shown at both ends. By making a rough plan of the roof and placing a dot upon each space to be laid in color, a roofer can go from the bottom to the top, having a finished roof of good appearance, and without much extra work. Of course a roof in design takes more time to put on than plain work, and should be charged for accordingly. However, the roofer will derive a wonderful amount of satisfaction from a fine-appearing roof every time he passes in, knowing that he laid it. After more than 40 years' experience in "tacking 'em down," the big thing of it all is to take time and care to do the work well. Undue haste is the cause of unsatisfactory results.

Among the contemplated improvements in Garden City, L. I., is a $60,000 clubhouse designed by Morrell Smith, Far Rockaway, N. Y. The building will be of Colonial style of architecture and the exterior covered with wide clapboards painted white, while the roof will be a moss-green. There will be spacious verandas on several sides and the larger one will face the eighteenth hole of the golf course.

A SUBURBAN COTTAGE OF EIGHT ROOMS

AN ATTRACTIVE EXTERIOR COMBINED WITH COMPACT ARRANGEMENT OF ROOMS—VARIOUS DETAILS



THE type of cottage which we have selected this month as the basis of our colored supplemental plate is well adapted for erection in the suburban districts of the country, at the lakeside, in the mountains or near the seashore. Some of its noticeable exterior features are the pergola-like porch, the generous overhang of the roof, the substantial brackets, the small dormer windows and the balcony effect at the attic windows in the gables of the cottage.

THE MAIN FLOOR PLAN

On the main floor are dining room, living room, kitchen, two sleeping rooms and bath room. The feature of the living room is the open fireplace laid up with yellow unglazed tile 4 x 4 in. square and with tile hearth to match. Communication between the dining room and the kitchen is established by means of a commodious pantry fitted with sink placed under an outside window and from this pantry is the door leading to the cellar stairs. The bath room is placed between the kitchen and bed room at the rear of the house and opens into a hall extending from it to the living room. On the second floor are three sleeping rooms all provided with clothes closets and under the roof of the front gable is unfinished space which may be used for storage purposes, or fitted up as an additional sleeping room if such a course prove desirable.

The cottage is intended for erection upon a lot having a frontage of 40 ft., although a 50-ft. lot would provide more space for a runway or a lawn. According to the specifications of the architect, the foundation walls are to be of common brick and 12 in. thick, resting on a footing course of concrete 10 in. thick projecting 6 in. on each side of the wall. The foundations are to be well bonded, with every sixth course a heading course, and all joints struck smooth. The outside of the brick walls below the concrete level is to be waterproofed.

THE CHIMNEYS

The chimneys are to be of selected brick set upon a concrete bed projecting 6 in. on all sides. The chimneys are to have 8 x 12 in. flues lined with terra cotta flue lining. The tops of the chimneys are to have either bluestone caps or cast concrete tops.

The framing timbers not otherwise specified are to be of spruce or hemlock according to preference. The girders are to be 6 x 8 in. yellow pine; the sills 4 x 6 in. laid flat; the first and second floor beams 2 x 8 in. yellow pine placed 16 in. on centers or spruce may be used if desired. The rafters are to be 2 x 6 in. yellow pine or spruce and placed 20 in. on centers. The ridges are to be 1¼ x 8 in. yellow pine. All framing is to be constructed of "balloon style" and thoroughly spiked together. The framing shall clear the chimneys in all cases by not less than 2 in. A truss is to be constructed for the opening between the living room and the dining room, as well as in connection with other openings, when more than 3 ft. wide. The beams are to be doubled for all headers and trimmers as well as around chimney and stair openings, etc.

THE EXTERIOR COVERING

The outside frame is to be covered with 1 in. tongued and grooved sheathing boards laid diagonally and covered with building paper over which 6 in. siding is to be laid. The rafters are also to be covered with sheathing boards and building paper over which are to be placed shingles laid 5½ in. to the weather.

The floors are to be double, the sub-flooring being rough boards while the finish floor is to be of ⅞ x 2½ in. tongued and grooved first quality chestnut or maple according to preference.

All interior trim is to be thoroughly seasoned white pine or chestnut. The cornice is to have plain fascia and simple moldings and soffits and to return as shown on the elevations.

Heavy ornamental wooden brackets are to be erected and exposed rafters are to be dressed down. The underside of the exposed tongued and grooved roof sheathing boards are also to be dressed.

The plastering is to be three-coat work and have a hard white finish in all rooms.

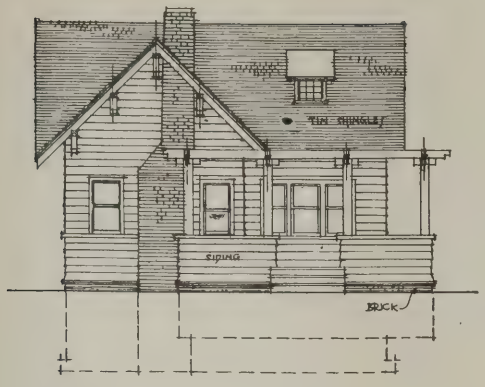
THE FLASHINGS

All tin for flashings, etc., is to be painted on both sides with metallic paint before laying. The leaders and gutters are to be of galvanized iron painted. Step flashing is to be built in chimneys and flashed to the main roof, also over all window and door openings and at sills to make a tight job.

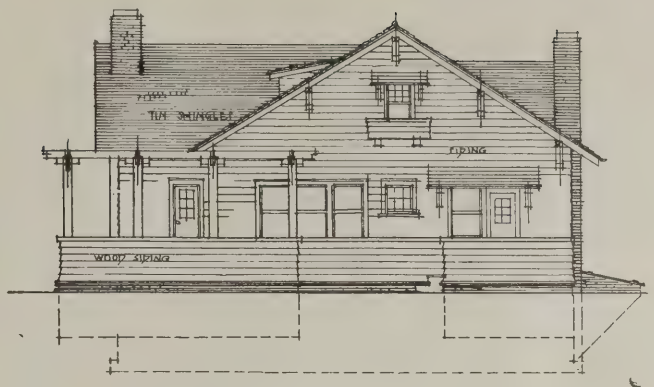
The house is to be wired for electricity and piped for gas. It is to have approved switches and cut-out boxes for electrical work. The fixtures are to be of the combination type for gas and electricity. The dining room and living room are to have 4-light drop pendants, combination fixtures and wall brackets for the bed rooms. There are to be ceiling lights for kitchen and pantry, also a light for the entrance door controlled from the living room.

The hardware is to be a dull finish with glass knobs and special locks for entrance and kitchen doors.

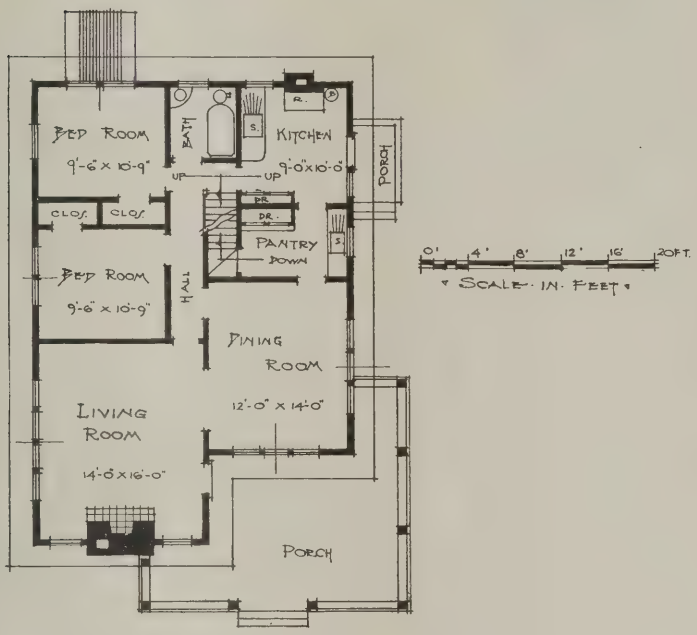
The house is to be heated by steam and the heat-



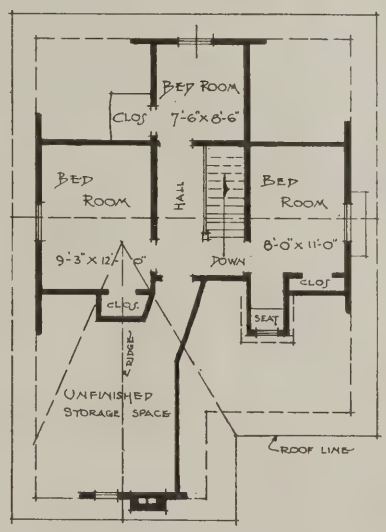
FRONT ELEVATION



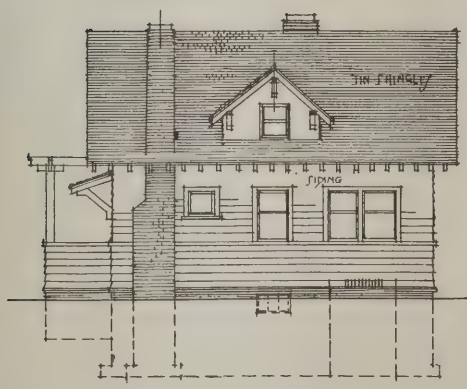
SIDE ELEVATION



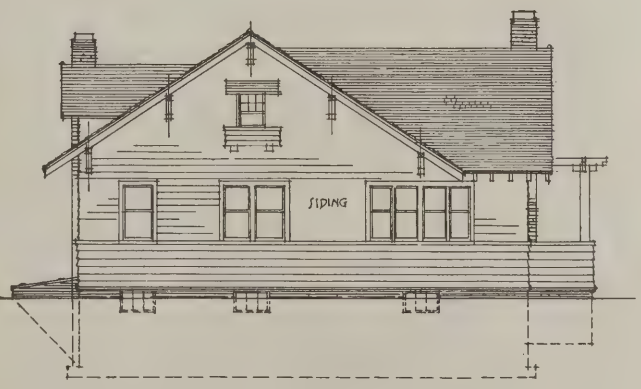
FIRST FLOOR PLAN



ATTIC PLAN

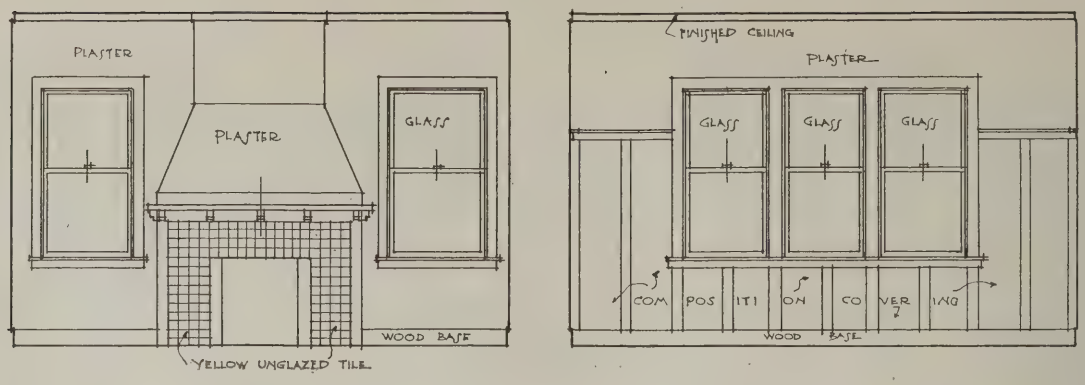


REAR ELEVATION



SIDE ELEVATION

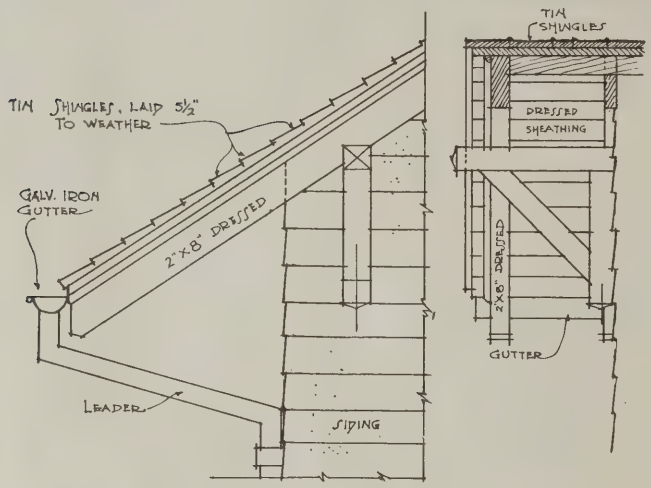
PLANS AND ELEVATIONS OF COTTAGE SHOWN ON THE SUPPLEMENTAL PLATE



LIVING ROOM DINING ROOM

ELEVATIONS SHOWING LIVING AND DINING ROOM INTERIOR FINISH

SCALE 0 1 2 3 4 5 6 7 FEET

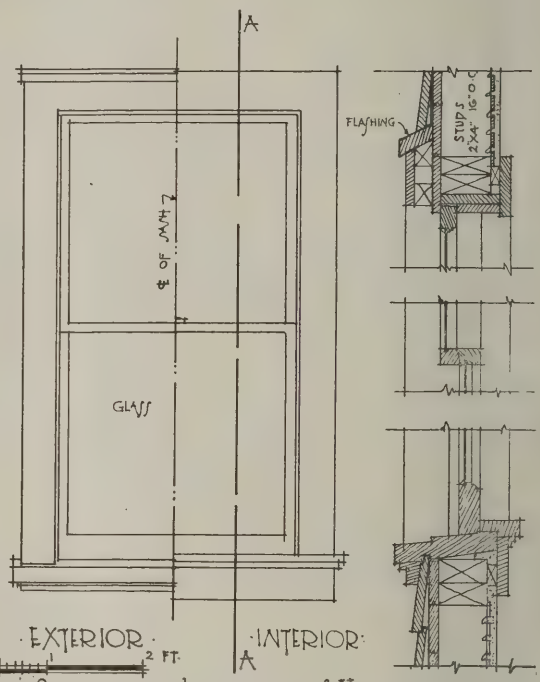


FRONT VIEW SIDE VIEW

CORNICE BRACKET DETAIL

SCALE 0 1 2 3 4 FEET

SCALE FOR CORNICE DETAIL



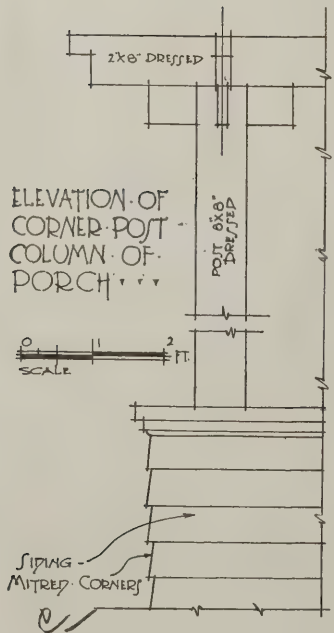
EXTERIOR INTERIOR

SCALE FOR WINDOW 0 1 2 FT.

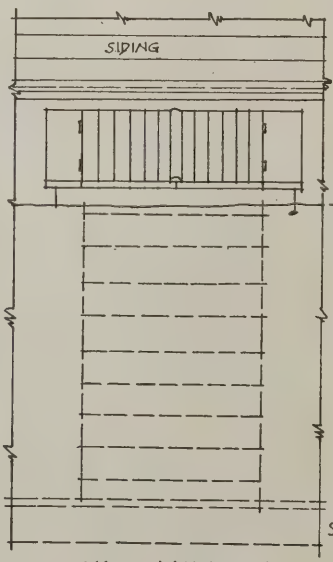
SCALE FOR SECTION 0 1 2 FT.

SECTION A-A

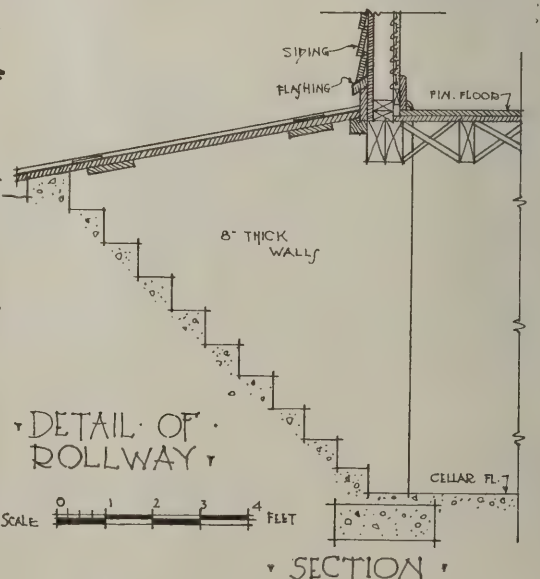
TYPICAL DOUBLE-HUNG WINDOWS



ELEVATION OF CORNER POST COLUMN OF PORCH



ELEVATION



DETAIL OF ROLLWAY

SECTION

MISCELLANEOUS CONSTRUCTIVE DETAILS OF COTTAGE SHOWN ON SUPPLEMENTAL PLATE

ing pipes are to connect with radiators in all rooms except the kitchen. The rooms are to have plain radiators under the windows where practical. The steam heating plant is to be of such capacity as to guarantee a temperature of 70 deg. in zero weather. Heating pipe uprights are to be exposed and bronzed, also the radiators.

The bath room is to be provided with regulation plumbing fixtures of porcelain enameled iron of modern design and pattern and to have nickel plated fittings. The soil and vent pipes are to be extra heavy cast iron; the vent to be 3 in. and the soil line 4 in.

The bath room is to have a tile floor laid on a concrete bed constructed between the beams, also a tile base and wainscot. The water closet is to rest on a marble slab.

All exterior wood siding, trim and metal surfaces are to receive three coats of paint.

The interior woodwork is to receive three coats of paint ground in linseed oil, the general color to be a rich brown.

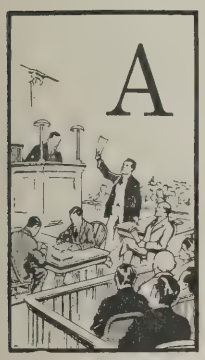
The architect estimates the approximate cubical content of the cottage here illustrated to be 26,208 cu. ft. on which he places a unit price of 20 cents per cubic foot. He states this estimate does not include the profit of the contractor, nor does it include any special section of the country, as prices of labor and materials differ greatly in different localities.

The plans, specifications and miscellaneous constructive details here presented were prepared by Frank T. Fellner, Architect, 413 Caton Avenue, Brooklyn, New York, or care of THE BUILDING AGE, 50 Union Square, New York City.

LEGAL ASPECTS OF BUILDING OPERATIONS

FRAUDULENT PRACTICES AS LARCENY—CONTRACTOR'S LIABILITY FOR DEFECTS—DECISIONS AFFECTING THE ARCHITECT

By A. L. H. STREET



AMONG those decisions lately handed down by the appellate courts of the country with important bearing upon the building trades, one of the most notable is the holding of the Minnesota Supreme Court in the case of State vs. Harris that the State Legislature did not exceed its constitutional power when a law was passed in Minnesota in 1915 making it larceny for a contractor or sub-contractor on any improvement of real estate "who, with intent to defraud, shall use the proceeds of any payment made to him on account of such improvement by the owner of such real estate or person having any improvement made for any other purpose than the payment for labor, skill, material and machinery contributed to such improvement, while any such labor performed, or skill, material or machinery . . . remains unpaid."

To an indictment for violating this law defendant pleaded unconstitutionality of the act as being discriminatory against a particular class, and as providing, in effect, imprisonment for non-payment of debts. In overruling these objections, the Supreme Court said:

"This statute does not select any class of persons for special consideration, but declares that certain acts done by certain persons under certain circumstances, and with fraudulent intent, shall constitute larceny. The Legislature has power to pass such an act, and the exercise of that power under the circumstances here shown is not class legislation. * * * The purpose of the statute is not to imprison for debt, but to punish the fraud. * * * No honest man can possibly be injured by the provisions of the act of 1915. Only the contractor who diverts money with the evil intent to defraud need fear the law."

WHO BEARS THE FIRE LOSS?

Another important decision, lately announced, is that of the California Supreme Court, bearing on the right of a builder to recover for work done on a structure before its accidental destruction by fire. In this case—Ahlgren vs. Walsh—the court holds that if the entire contract price was agreed to be paid at the completion of all the work, the contractor must bear the loss occasioned by fire before such completion; nothing being due him until full performance of his contract. If the compensation is payable in installments during the progress of the work, he cannot recover an installment earned but not paid at the time of the fire, until the reconstruction has proceeded to the stage necessary to make it due. He must stand the loss resulting from the fire and must replace at his own expense the structure that is destroyed.

The court notes that these rules of law are, of course, controlled by any specific provision of the contract, being applicable only when the agreement is silent as to who shall bear the loss of fire pending performance of the contract. Accordingly, the court holds that under the provision of a building contract that, if the work be wholly destroyed by fire before completion, the loss shall be borne by the owner to the extent of installments due or paid, the contractor is entitled to payment of an accrued installment before he is obligated to reconstruct the building to the condition it was in at the time of the fire.

"It is certain that the builder is not an insurer. Nor is he required to respond to the owner on account of defective construction, except in accordance with the precepts of ordinary care, unless the obligation is affixed upon him through special contract to do so."

This is what the St. Louis Court of Appeals recently declared in the case of Flannery vs. St. Louis Architectural Iron Co., in which plaintiff, a contracting builder, was denied the right to recover damages against defendant on account of latent defects in steel rods purchased from the defendant

which later caused the roof truss in which they were used to collapse; it appearing that the owner had accepted the building before the accident.

The theory of the decision is that plaintiff was not liable to the owner of the building on account of the breaking of the rods, because they were bought from a reputable manufacturer and because the defects were not discoverable on the reasonable inspection the builder made of them before putting them in place. So, the court finds that, in reconstructing the roof after its collapse at his own expense, the builder did what was not legally required of him, and, therefore, he had sustained no damage against which he could compel defendant to reimburse him. The opinion says:

"Here it is conceded there was no special contract requiring plaintiff to mend the roof in any event or make good any other part of the building which should fail because of latent defects in materials not discoverable through exercising ordinary care to that end. Of course, there is no absolute warranty implied by law against the builder, for the measure of his duty, as above stated, is to be ascertained by reference to the standard of ordinary care and skill. * * * Had plaintiff manufactured the iron rods himself, it might be that he would be liable to respond to the owner for the latent defect in the weld because of the failure of his servants to exercise ordinary care thereabout."

ARCHITECT'S RIGHT TO COMPENSATION

When a statute or ordinance requires an architect to obtain a license before pursuing his occupation, an unlicensed person is not entitled to recover compensation for services in preparing plans and specifications, although his employer may have known that no license had been obtained. This point was declared by the Michigan Supreme Court recently in the case of Wedgewood vs. Jorgens.

Plaintiff prepared plans and specifications for a building which defendant contemplated but later abandoned, and plaintiff sued to recover the agreed compensation. The defense interposed was based on plaintiff's non-compliance with a local ordinance requiring architects to obtain annual licenses, pay a $5 fee, and furnish a $1,000 bond. The ordinance defines an architect as being any one who plans or supervises the erection or alteration of buildings for others, the construction work being done by third parties. Plaintiff, a builder and contractor, did not do the work in question himself, having it done by an unlicensed architect, with the assent of the owner.

In determining that plaintiff was not entitled to recover, the Supreme Court holds that the employing owner's knowledge that no license has been obtained did not avoid invalidity of the contract of employment; and that the fact that the city authorities had not enforced the ordinance did not deprive the regulation of its binding effect.

An architect employed to superintend the construction of a building for lump sum compensation is entitled to extra pay for prolongation of the work by changes in the plans made at the owner's instance, holds the Texas Court of Civil Appeals in the case of Shear vs. Bruyere. The court cites an earlier decision in the same State wherein it was decided that notwithstanding a contract to superintend the construction of a building for a lump sum, still, if the owner made changes during the progress of the work, requiring longer time to complete the building than originally contemplated, and the work was done with the owner's knowledge, the architect could recover extra compensation for such additional services.

SILO MAKERS ORGANIZE

A number of the leading manufacturers of cement stave silos recently came together in Chicago and formed an association with officers for the ensuing year as follows:

President....H. H. Allison of Salina, Kan.
Vice-Presidents..E. L. Page of Kingsley, Iowa.
..J. F. Outcault of Wauseon, Ohio.
..W. C. Couleham of Longmont, Col.
Secretary..W. A. Warriner of Ottawa, Ill.
Treasurer..W. H. Holmes of Gardner, Ill.

Those eligible to membership in the association include manufacturers of stave silo machines, silo staves, silo accessories as well as publications and individuals who desire to assist in promoting the interests of the association. The meeting was called under the auspices of the Farm Bureau of the Portland Cement Association.

HUGE MODEL OF COMMODORE HOTEL

In connection with the colossal Commodore Hotel which is now in course of construction at Lexington Avenue and Forty-second Street, New York City, and which when finished will be twenty-six stories high, is a model made of wood pulp, the cost of which is said to have been equal to that of a good-sized cottage in one of the suburban sections. The model is said to be the first of its kind ever made of a gigantic hotel and will be the first to be sent to the principal cities in the United States for exhibition purposes. This will afford architects, builders and others interested an opportunity to see what New York's largest hotel will look like. Some idea of the magnitude of the work may be gathered from the statement that the model has over 1000 windows and is perfect in every detail. The work was done under the direction of Francis T. Gilling, a painter and sculptor, and required the services of himself and six workmen for a period of six months.

PRESERVATION OF SILOS

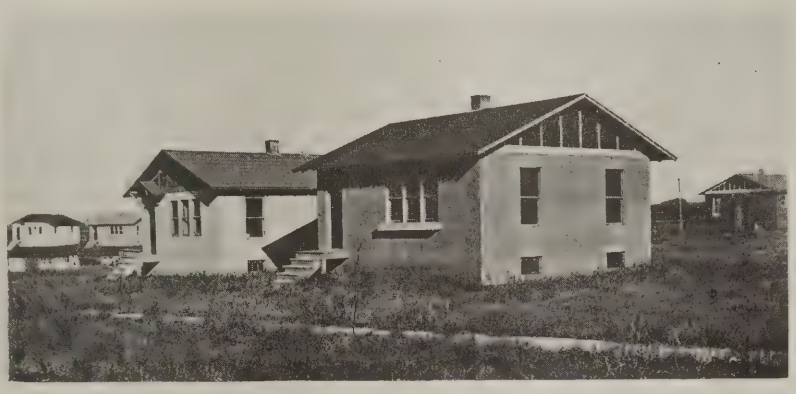
With a view to determining the best method of preserving silos, experiments were recently made by the Forest Products Laboratory in connection with which creosoted wood staves were driven into one of the silos of the University of Wisconsin and analyses were made of the ensilage in contact with these staves. It was found that although the ensilage contained a certain amount of creosote it did not prove injurious to the appetite or health of the cattle. This is said to confirm the results of previous studies.

CONCRETE COTTAGES FOR WORKINGMEN

TWO EXAMPLES EMBODYING COMPACT ARRANGEMENT OF ROOMS WITH ECONOMY OF CONSTRUCTION

By W. E. FRUDDEN

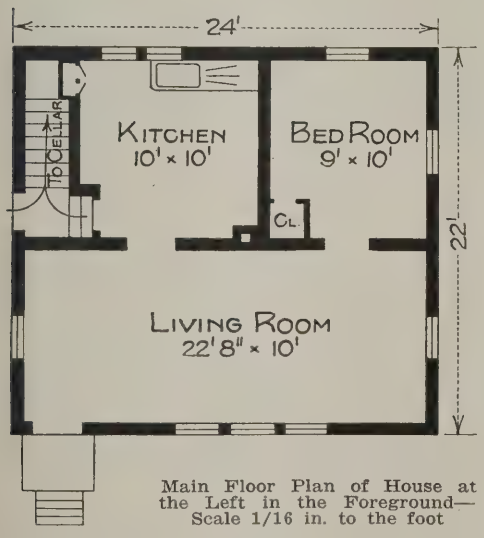
I HAVE noticed in the recent past that a great deal of attention has been given in many sections of the country to the construction of inexpensive cottages for housing workmen and their families, and it may not be without interest to briefly refer to a colony of some twenty-five concrete dwellings of this character lately built near Charles City, in the State of Iowa. The buildings are but a single story in height with well-lighted basements, and two of them are here shown—one having a frontage of 24 ft. with a depth of 22 ft. while the other has the frontage the 22-ft. way thus giving an entirely different arrangement of rooms in the house as may be seen from the plans. Economy of construction was facilitated by building at the same time, and on lots that adjoined, one each of the two types utilized in the colony. Only one setting of the concrete mixer and other machinery was therefore necessary for the erection of two of these little cottages.



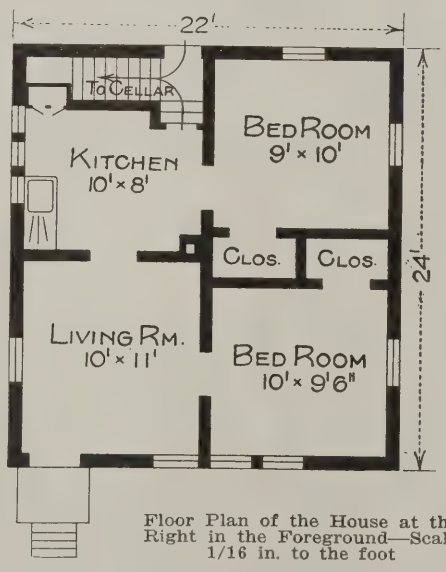
A House of Each Kind in the Colony Was Built on Adjoining Lots

The basement of each house is fully 7½ ft. in the clear and is well lighted as the first floor is 2½ ft. above the grade line. The floors as well as the walls are of reinforced concrete construction and the same is true of the first floor ceilings so that the cottages are practically fireproof.

The concrete used in the floors consisted of a mixture made up of one part Portland cement, two and one-half parts sand and five parts of crushed rock. The large concrete mixer operated by electric power discharged the mixture into a carrier which was elevated about 15 ft. The concrete was then dumped into a long trough which carried it into the steel "forms" for the walls.



Main Floor Plan of House at the Left in the Foreground—Scale 1/16 in. to the foot



Floor Plan of the House at the Right in the Foreground—Scale 1/16 in. to the foot

The reinforcing material consisted of ⅜-in. square twisted steel rods which were placed in the wall 5 ft. on centers and in the center of the 8 in. of concrete representing the thickness of the walls. The form sections of steel were 16 x 22 in. in size and held together by ½-in. bolts running through

short pieces of cast pipe which remained in the walls. After the forms were removed the open ends of the pipe were filled with cement so as not to be noticeable in the completed wall.

The building of one house of each type on adjoining lots enabled the foundation and floors of one house to be poured and set while work was being carried on in the other house on the adjoining lot. In this way the work alternated so that the loss of time was reduced to a minimum.

In the picture presented herewith is shown the two types of cottages in question and below is the floor plan of each showing the general arrangement of the rooms.

The gable ends of each cottage as well as the roofs are covered with a prepared roofing made by Bird & Son. The gables are panelled so as to add to the appearance of the finished structure.

A simple system of plumbing was installed in each cottage, there being a closet in the basement and a sink in the kitchen supplied with running water. One connection with the city sewer carries away all the waste from the two houses.

The inside finish of both types of cottages is exceedingly simple, there being no casements for either doors or windows. The 1¾-in. jambs are of 6-in. lumber so that they do not cover the entire thickness of the 8-in. concrete walls. A small 2-in. cove molding runs around the openings, giving them a very neat finish.

WATERPROOFING THE CONCRETE

Every precaution was taken to make the concrete used in connection with the cottages waterproof. For the walls below ground a heavy tar preparation was applied to render them moisture-proof, while above grade the walls were painted with a water-proofing preparation, each house being given a different color, the shades running all the way from a blood red to a sky blue.

The cottage having a frontage of 24 ft. is divided into three rooms, all of which are good size. The living room extends entirely across the front of the house and is lighted by a triple window in the front wall and one at each end. The bedroom in the corner is lighted by two windows and is provided with a clothes closet.

There is an outside entrance to the cottage from the grade line and the basement is also reached from this entrance. A cupboard is built in over the stairs leading to the basement and the sink in the kitchen is placed under the twin windows in the rear wall. The chimney is located on the center line of the cottage, thus serving both for kitchen and living room. In the basement is a laundry and two good-sized storerooms.

The cottage having the 22-ft. frontage is arranged with four rooms of which two are bedrooms and each has a commodious closet. The outside entrance to the kitchen is from grade as in the case of the other house except that the entrance is at the rear instead of at the side.

The cost of each of the houses in the group was about $1,200.

TWO HANDSOME THEATERS FOR PROVIDENCE, R. I.

The building outlook for the present year in the city of Providence, R. I., is regarded by Building Inspector S. B. Hopkins as very encouraging. Many important projects are under way, not the least of which are two handsome theaters, one to be known as the Majestic, involving an estimated outlay of something over a quarter of a million dollars, and the other Keith's new theater, to cost in the neighborhood of half a millon dollars.

The Majestic, now rapidly nearing completion, is three stories in height, and has a frontage of 120 ft. on Washington Street, 160 ft. on Empire Street and 160 ft. on Aborn Street. It is constructed of brick with a white matt glazed terra cotta and colored ornamental front. The building is fireproof, has tiled floors, modern plumbing and heating systems, electric fan ventilating system and entrances and exits on three main streets. The lobby is 24 x 40 ft., finished in imported Italian and Egyptian marbles, ornamental stucco and bronze work. The lobby is lighted by a large stained art glass dome. On each side of the foyer are marble staircases leading to the balcony foyer, from which are five direct entrances to the balcony. On each side of the auditorium are loges seating from four to ten people and also staircases leading to the men's and women's toilets finished in imported marble with tile floors.

The stage is 30 x 40 ft. and the proscenium opening 35 ft. high. Under the stage are sixteen dressing rooms, shower baths, toilets, etc. The seating capacity of the theater will be 3000 people.

The plans were prepared by Architects Wm. R. Walker & Son, 17 Custom House Street, and the general contractor for the execution of the work was William Williams, 86 Weybosset Street, both of Providence, R. I.

The new Keith theater now under way is located on Snow and Chapel Streets, but will have an attractive foyer on Westminster Street. This half-million dollar enterprise will be constructed under the supervision of Warren, Moore & Company of Philadelphia, Pa.

Another improvement just being started is that of the new building for the Rhode Island Hospital Trust Company on Westminster Street, Washington Row and Exchange Place, covering an area of about 24,000 sq. ft. It will be eleven stories in height and will contain more floor space than any other structure of its kind in the city. The plans were prepared by Architects York & Sawyer, 50 East Forty-first Street, New York City.

The Builders' Exchange of Grand Rapids, Mich., has joined with the local Y. M. C. A. in the establishment of an architectural course. Eugene Osgood of the firm of Osgood & Osgood, architects, heads the organization committee. The object, it is announced, is not to turn out finished architects, but to prepare young men to fill the positions of building foremen, superintendents and contractors.

ARRANGEMENT OF SLIDING GARAGE DOORS*

PARALLEL DOORS ARE CONSIDERED—SOME OF THE HARDWARE USED—VARIOUS DETAILS

By E. J. G. Phillips.

A TYPE of door particularly adapted to openings large enough for two or more cars, but also practical in some other cases, is the parallel door. The pictures in Figs. 23 and 24 show parallel doors in closed and partially opened positions in a two-car garage of brick construction.

Double or triple tracks may be used as required. A steel weatherstrip is placed between the tracks to close the space between the tracks and the top of the doors. This extends from the header to an inch or two below the top of the doors. The sectional views in Fig. 25 illustrate double and triple tracks for sidewall attachment, while Fig. 26 shows cross sections of double and triple tracks for overhead attachment. Floor guides set into the floor and floor guide weatherstrips attached to the bottom of the doors, as shown in Fig. 27, should be used if it is desired to make the bottom of the doors weathertight. The space between the floor pieces is open at the bottom and suitable drainage should be provided by setting it on a bed of cinders or otherwise as conditions may allow. If floor guide weatherstrips are not used, a double or triple guide should be located in the floor where the doors overlap each other. These are shown in Fig. 25. These guides, which are made adjustable for different thicknesses of doors, should be securely anchored in the floor.

The elevation Fig. 28 shows the hardware applied to the doors. Both doors may be locked to the jambs with sliding garage door locks, or one door may be locked to the jamb from the inside by the parallel door bolt, Fig. 29, and the other locked with the sliding garage door lock previously mentioned.

*Continued from page 93, February issue.

If desired, the floor bolt, Fig. 30, may be used instead of the parallel door bolt. The joints between the doors where they overlap should be made tight by attaching strips to the doors as shown in Fig. 31. Ball-bearing door hangers, as illustrated in Fig. 26, should be used to insure easy operation.

The plans in Fig. 32 cover general practice and requirements. Plan M-1 is a single opening closed by two doors, both of which are moved back parallel with the front wall to clear the opening. Plan M-2, in which two doors close the entire front of the garage, is the most popular parallel door used for private garages. Double tracks are used, one door sliding on each. Either half of the opening may be cleared by moving one door. Three doors on two tracks are shown in plan M-3. Only one opening can be used at a time. The same building with three doors and triple tracks is shown in plan M-4. Any two openings can be used at a time. The three tracks extend entirely across the building and the doors can be moved in either direction. If there is a front wall space equal to the width of one door, the plan M-5 may be used and all the garage doors can be opened at one time. Plan M-6 is a double opening similar to plan M-1, one pair of doors sliding to the right and one to the left. The top weatherstrip may be omitted in the first and the last two plans if the soffit is built out to meet the doors which slide on the tracks farthest from the wall.

The reference letters in the table which follows apply to the cross section of double and triple tracks previously referred to. The fifth column is based on having the bottom end of the strip in line with bottom of head jamb. The doors should lap the



Fig. 23—Garage with Parallel Doors Closed



Fig. 24—Parallel Doors Partially Opened

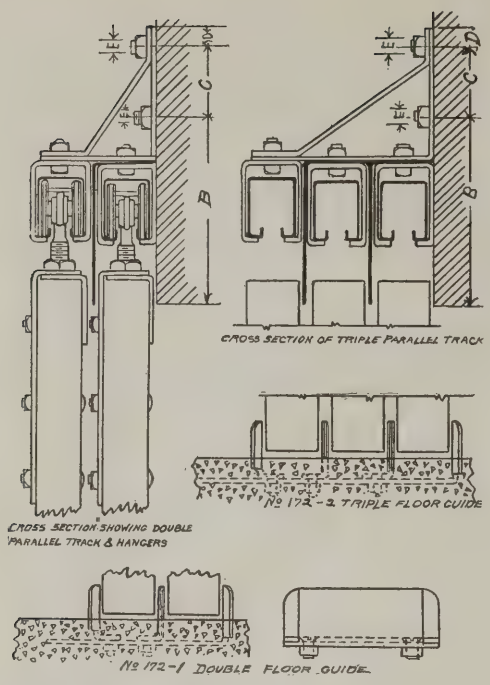


Fig. 25—Double and Triple Tracks for Sidewall Attachment

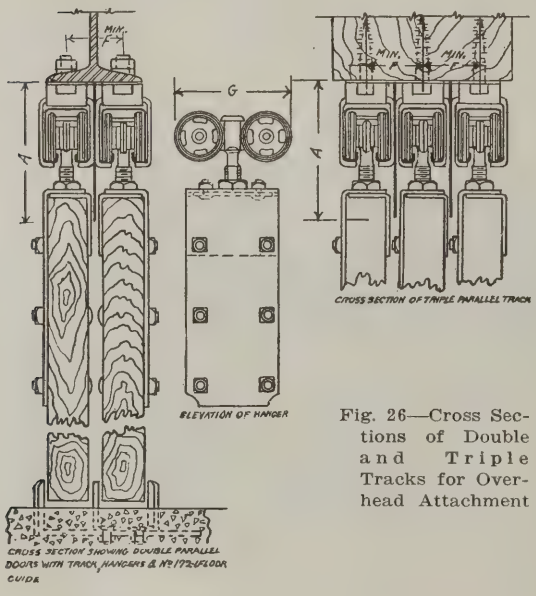


Fig. 26—Cross Sections of Double and Triple Tracks for Overhead Attachment

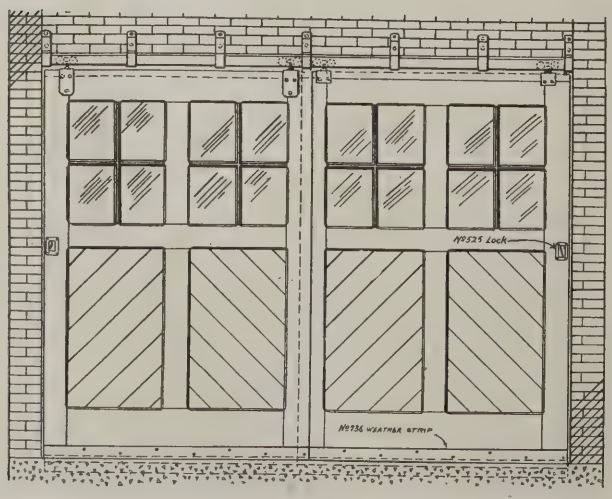


Fig. 28—Elevation Showing Hardware Attached to the Doors

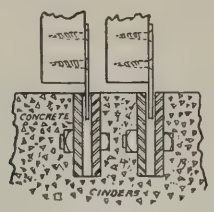


Fig. 27—Floor Guides Set Into the Floor

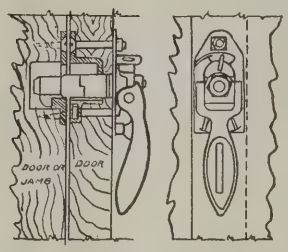


Fig. 29—Details of Parallel Door Bolt

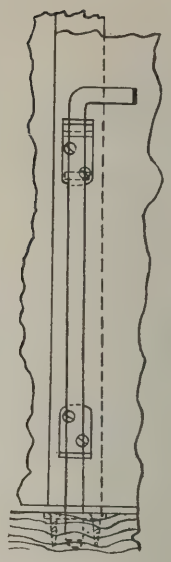


Fig. 30—The Floor Bolt

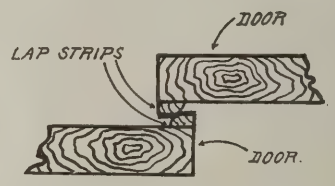


Fig. 31—Making Lapping Door Joints Tight

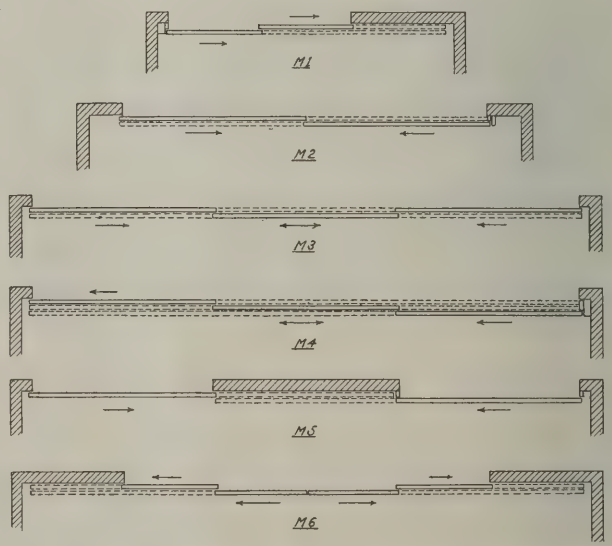


Fig. 32—Plans Covering General Practice and Requirements

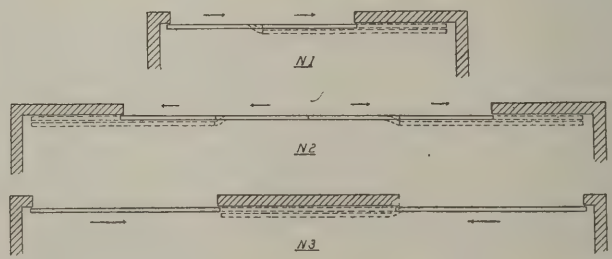


Fig. 33—Plans Showing Doors in Line When Closed Instead of Overlapping Each Other

weather strip about 1 in. The foregoing parallel doors might be termed over-lap parallel doors.

The headroom required and other data is given in the following table:

Table of Headroom, etc.

Track No.	Hanger No.	Weight of Doors, Lbs.	A	B	C	D	E	F Min.	G
256	27½B	300	....	7½″	2¾″	¾″	½″	.....	....
257	28½B	500	....	7½″	3¼″	7/8″	5/8″	.....	....
258	(123½B	800	....	8⅞″	3½″	1″	¾″	.....	....
	(150½B	1000							
259	29½B	600	....	8¼″	3½″	1″	¾″	.....	....
356	27½B	300	6″	....	....	....	....	2 7/16″	5″
357	28½B	500	6½″	....	....	....	....	2⅝″	6⅜″
358	(123½B	800	7½″	....	....	....	....	3½″	7½″
	(150½B	1000							
359	29½	600	7″	....	....	....	....	2 15/16″	6¼″

Another set of floor plans in which all the doors stand in line when closed instead of overlapping each other is given in Fig. 33. In these plans, a compound curve is used in one or more of the tracks. The meeting styles of the doors may be rabbeted or tongued and grooved to make a tight joint. It is always necessary to have a front wall space at least as wide as one door, behind which to slide the doors. Plan N-1 requires two doors. These may be made to slide to the right or to the left. The door with the straight track must always be opened first; plan N-2 indicates two doors sliding to the right and two to the left. This is the door plan of the spacious stucco garage with tile roof which is shown in Fig. 34. A garage front with central wall space and an opening near each side is given in Plan N-3. Both doors lie close to the wall when closed but when open, the doors are parallel, one standing in front of the other. Obviously, in any of these plans all the doors can be thrown open so the entire opening will be clear. Weather strips are not required at the top of these doors. A floor bolt should be used



Fig. 34—Stucco Garage of Which Door Plan Is Shown in Fig. 33.

to lock the door which slides on the curved track, see elevation Fig. 35. The front end of this door is confined by an end floor stop or a center floor guide if as in plan N-1 or N-3. The door on the straight track is then locked to the first door with a sliding garage door lock. The back end of this door is confined to the wall by a special guide set into the floor of the garage.

Special knuckle jointed hangers are required for the doors which slide in the curved tracks. The hanger on the front end of the door which slides in the curved track, must be located as near the edge

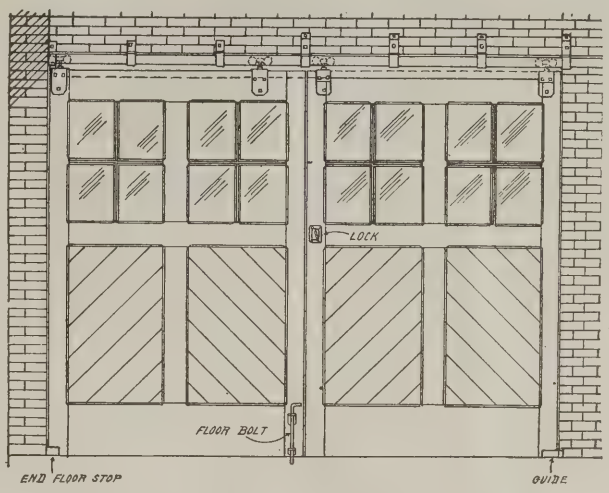


Fig. 35—Elevation of Door Which Slides on the Curved Track

of the doors as possible, but the back hanger must be set a considerable distance from the edge of the door. These doors present an exceptionally neat appearance but their use is more particularly adapted to the larger garages.

DURABILITY OF STUCCO AND PLASTER CONSTRUCTION

In view of the extent to which stucco-coated buildings of all kinds are being erected throughout the country, the information presented in a progress report of the Bureau of Standards containing results of investigations up to April, 1916, and bearing the title "Durability of Stucco and Plaster Construction" cannot fail to command widespread attention. This report of progress is in connection with an investigation of stucco and plaster undertaken by the Bureau of Standards five years ago in co-operation with the Associated Metal Lath Manufacturers.

In 1915 a test building, 200 ft. long, was erected, having 56 panels representing the common types of stucco construction, including a variety of mixtures on metal lath, wood lath, hollow tile, brick, concrete block, plaster board, gypsum block and concrete bases. Examination of the panels six months after completion showed that a number were in poor condition. About 40 were rated as satisfactory, the remainder being in various stages of deterioration. It is evident, says the report, that the smooth type of finish known as the "sand float finish" is well adapted to bringing out the small defects, such as cracks, blotches, uneven texture, etc. This report contains suggestive information, but definite recommendations, it is stated, are deferred until further service-test results are known.

BUILDING AGE

(Founded in 1879 by David Williams)

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APRIL, 1917

VENTILATION OF GARAGES

Judging from the present trend of public opinion it will probably be necessary in the very near future to compel the ventilation of garages or to make provision for it in those which will be erected in the future. The records of the health departments show that a number of deaths have occurred, particularly during the winter season, in the small garages as well as in some of the larger ones in which the automobile is kept. Frequently in trying out the motor no account is taken of the amount of deadly gas that is generated and liberated through the exhaust when it is working under improper conditions, and before they have been righted the operator is overcome. In most instances in the cold season the disposition is to keep the garage as nearly airtight as possible in order that it may be more readily kept above the freezing temperature. The effort to avoid freezing is made with a view of doing the necessary heating with the minimum of expense. In natural gas sections, in many instances, an air heater of some character keeps the air in the building in motion and prevents an accumulation of gas at any one point, and insures such a stirring up as effectually dilutes it. This is not sufficient, and it seems that it is likely to be necessary to provide ordinances which will compel provision for the exhaustion of smoke and gases generated so that the danger to life will be eliminated.

COMFORT STATIONS OF LOW COST

Encouragement for those who urge the erection of low-cost comfort stations throughout the country instead of the more pretentious buildings in the center of large cities will be found in the course being pursued in St. Louis, where two stations, at a cost of $2,500 each, are to be built at different points where they will be of greatest accommodation to the traveling public. As the city authorities are giving attention to this provision in the interest of public health and convenience, their value is becoming impressive, and they see the great desirability of having several located at different points, each costing a small sum, in preference to one costing a large amount, of the character to which the politicians can point with pride. It is desirable that plumbers' associations should acquaint themselves with the plans and character of comfort stations in order that they may bring them to the attention of their local authorities and give such information in reference to the cost as will encourage the expenditure for comfort-station erection. To extend this work every master plumbers' association should have a comfort-station committee to collect data and present it to both the people and the proper authorities. It is in keeping with the activities of the master plumbers' associations throughout the country in protecting the public health and in assisting health boards wherever questions arise in reference to house drains and water supply.

CONTRACTOR RELIEVED FROM LOSS

An unusual experience is given in a New England paper, to the effect that a man who had made the low bid for a heating and ventilating system for a school building was released from his bond on the announcement that he had discovered an error in his figures which would lead to a loss. The matter was brought to the attention of the school board, and to the engineer in charge of the work, and after consideration the bidder was relieved of responsibility, the work being given to the next highest bidder, who was willing to carry out the work at the figures he had given.

If the school board had adhered to its rights, the

original bidder would have had either to withstand a loss of over $1,000, or have given up the certified check for $400, which he had furnished as evidence of his good faith for carrying out the contract. This is far better disposition of the matter for all concerned than a custom too frequently followed by men who discover they have made an error and then endeavor to carry through the work in a way that will save them from loss, with the result that the finished work is by no means of the quality and character that was expected. Here the school board saved itself from the risk or possibility of having such an equipment provided.

WILLIAMSBURG'S FIRST ELEVATOR APARTMENT HOUSE

There has just been filed with the Bureau of Buildings plans for the first elevator apartment house to be constructed in the Eastern district of Brooklyn, otherwise designated as Williamsburg, N. Y. This structure will be six stories in height and will occupy a plot 75 x 179 ft. in South Ninth Street, 171 ft. east of Bedford Avenue. Its exterior will be in the Italian Renaissance style of architecture and the roof line will be broken with two high towers. Accommodations will be provided for forty-eight families and the building is estimated to cost in the neighborhood of $200,000. The plans were filed by the architects, Shampan & Shampan, 772 Broadway, Brooklyn, N. Y.

A MAMMOTH FARM BUILDING

What is said to be the largest farm building in this section of the country is in process of construction at Roanoke, Riverhead, Long Island, N. Y. It is 90 x 180 ft. in plan and constructed of hollow tile and cement. It will be two stories in height, the second story being utilized for living quarters for two families of farm laborers. The building will be used for the storage of potatoes and cauliflower during the cold months of the year.

A PROSPECTIVE SKYSCRAPER

The fire insurance district of Manhattan Island is about to witness the erection of the nucleus for a twenty-story skyscraper which will rise at the northeast corner of John and Williams Streets, New York City. The present operation will consist in the erection of a two-story and basement building having a frontage on William Street of 89.6 ft. and on John Street of 125 ft. The construction will be such that eighteen additional stories can be added at any time, the proposed building being undertaken to cover the plans filed just prior to the passage of the zone law in July, 1916, which provides that projects filed prior to July 25 must have at least two stories completed within a year. The architect is F. H. Quimby, 99 Nassau St., New York.

FIRST SKYSCRAPER UNDER THE NEW HEIGHTS RESTRICTIONS LAW

A building which when completed will be rather unique in its external appearance is the first skyscraper to be erected under the provisions of the new zoning and building heights restrictions law which will occupy the site of the old Tiffany Studio building at the corner of Madison Avenue and Forty-fifth Street, New York City. It will be known as the Madison Concourse Offices and will be practically square in its ground area, measuring 125½ ft. one way and 125 ft. the other. The façades will be of brick, limestone and terra cotta, and in conformity with the new structural requirements which went into effect in July last the building will set back at the twelfth story, from which it will rise eight additional stories. The cost has been placed at $1,400,000, and the plans have been prepared by Architects Warren & Wetmore of New York City.

HOUSES FOR TRANSIENT LABORERS

Ever since the Wheatland, Cal., hop riots of several years ago, when one man was killed and two sent to the State Prison for life as a result of the improper housing and care of seasonal laborers, California has been working both officially and through private means for better conditions for transient laborers. State officials visit the various large camps and ranches with a view to insisting on proper plumbing and housing having regard to health, comfort, morals and general decency; and employers themselves have quite generally awakened to the desirability of better conditions for the large numbers of employees required for harvesting fruit and other crops.

A new move in this direction has been started by the Turlock-Modesto Fruit Growers' Association of Stanislaus County, Cal., which has now begun the construction of ideal houses for this class of laborers and their families.

One of the notable improvements under way in the Grand Central Terminal Zone, New York City, is a twenty-three story office building for which plans have been prepared by Architects Starrett & Van Vleck who place the cost at something over half a million dollars. The structure will be erected at the northwest corner of Madison Avenue and Fortieth Street and is expected to be completed by the spring of 1918. The contract for the construction work has been awarded to Rheinstein & Haas, Inc., 101 Park Ave., New York City.

While stucco is used on buildings with masonry walls, its greatest use is as a covering for buildings having a frame of wood. It has proven itself a practical and economical material wherever used for this purpose.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION

From T. H. A., Tacoma, Wash.—In the article under the above title which I submitted in the February issue of the paper, showing projections of a curved valley rafter, I note the fact that I committed an error in assuming that the valley between the points *A* and *B* were straight. If the roof of house *X* were a plane tangent to the curve at the point *B*, as is the house Y, my drawing, I think, would be correct, but since the roof of house *X* is a circular curve I should have projected sufficient points between *A* and *B* to obtain the true shape.

I refer to the January issue of the paper, in which "C. J. M." of St. Johns, Newfoundland, has a very clear description of this problem and in which the reader will see that the plan view *A-E* has a slightly reversed curve and the side view *D-C* has a gradual easement of the curve, but at no place becomes a straight line.

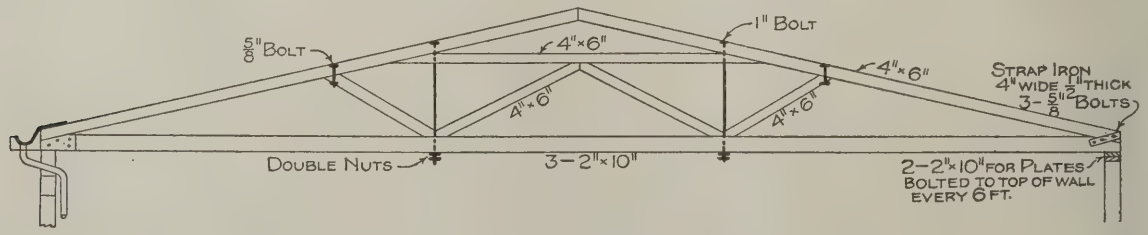
CONSTRUCTING A SELF-SUPPORTING ROOF OF WOOD

From L. A. R., Arco, Minn.—Some contractors may have better suggestions for the problem of "R. L. W.," Sturgis, Mich., than the one here presented, but it is one occurring in my own experience and I therefore present it for the benefit of the correspondent in question. As the span of the garage is 60 ft. I would suggest that 12 ft. material will do the work. Cut a piece 6 ft. in length and break joints in this manner. Give the span a crown of not less than 2 in.—a little more will do no hurt—and tighten the nuts which should be double; that is, there should be two. The strap iron at the end of the truss is the main part. Any carpenter of ordinary skill can finish up the cornice and a tinner can trim the gutter without going into any details on that subject.

The galvanized iron gutter may be placed 65 ft. from either end or it may be in the center of the building, according to preference. The gutter should project from the wall 16 in. and should be built of 2 x 10 in. stuff. Use one of these trusses every 8 ft. in place of common rafters. The bottom cord of the truss should be built up of three pieces of 2 x 10 in. stuff securely spiked together.

The wall plates should be made up of two pieces of 2 x 10 in. stuff bolted to the top of the wall every 6 ft.

From W. K., Highland Park, Ill.—For the benefit of "R. L. W.," who asked for particulars regarding a self-supporting garage roof, I would suggest the lattice truss which is rounded on top and is built up of comparatively small members. There are various firms in the country making a specialty of this type of truss and they would undoubtedly be willing to furnish "R. L. W." with a proper design for his building.



TRUSS CONSTRUCTION FOR SELF-SUPPORTING ROOF AS SUBMITTED BY "L. A. R."

QUESTIONS IN BUILDING CONSTRUCTION

From R. G. B., Paterson, N. J.—As one person cannot from both theoretical and practical experience learn all details of doing things in the best possible manner, I desire to ask the practical readers in regard to some points which have doubtless been demonstrated by their own experience.

What form of sill construction is considered the best, the square lumber sill or the box type sill?

In the case of a building to be of stucco finish, would 2 x 10 in. ripped to 4¾ in. to be used as studding, be of any material advantage?

Is it best to lay a sub-floor diagonally on the joists the same as the sheathing and should it be laid over the entire floor area before putting up the interior partitions?

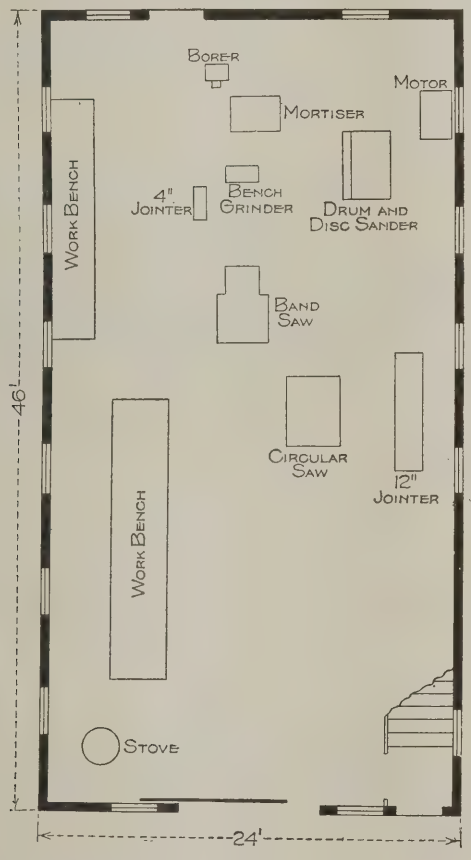
Have any of the readers had experience in

building houses fitted with double sash, that is, two upper sash and two lower sash each independent of the other? If so I would like to see published working details of them.

For a crack-proof plaster interior has the method ever been tried of applying plaster boards in the usual manner and over them a furring or corrugated wire lath nailed squarely to the studding through the plaster boards? I would like to know as to whether this method would be worth the increased cost, also whether the same method could be used for the stucco work?

A WELL ARRANGED SHOP

From J. W. Crosby, Goshen, N. Y.—Occasionally in the past I have noticed plans of carpenter shops showing the general layout of the machines with which they were equipped and I have thought it possible that some of the readers might be interested



CARPENTER SHOP OF J. W. CROSBY

in a plan of my own shop so I am sending it herewith. An inspection of the drawing will show that the machines are fairly well concentrated so that the handling of material is reduced to a minimum. The machines are operated by a 5-hp. motor which I regard as a most convenient power owing to the fact that it is only necessary to press a button and work may be commenced immediately. No coal or gasoline is required—all that is necessary being a little oil to oil the machinery.

It may be interesting to some of the readers to know the make of tools used in the shop and I would therefore state that the equipment consists of a 12-in. Clement jointer, a Sidney circular saw, a Sidney 36-in. band saw, a Sidney hollow chisel mortiser and a Sidney post borer, a Beach combination disk and drum sander, a Crescent 4-in. bench jointer and a Pryibil bench grinder.

The plan shows the location of the heating stove, the two work benches and the numerous windows which afford plenty of light for the workmen.

The subject of shop arrangement is one which ought to prove interesting to a great many and I should like to see the plans of some of the other readers of the paper.

A BUILDER'S VIEW OF THE LAW LICENSING ARCHITECTS

From J. H., Chicago, Ill.—Carpenters and builders in this section of the world have nothing more to do with the drawing of plans for houses since the law licensing architects went into effect. My personal experience as a builder is that this law creates a lot more trouble for the building contractor although the architects fiurnish fine drawings, but that is all they are. In most cases we cannot follow the plans owing to the fact that inside and outside measurements always differ from 1 to 3 ft.; therefore, we have to make them over on another sheet of paper in order to work from them. For this trouble we get no pay. The law, both state and municipal, forbids contractors to make plans even for their own houses, and to voice my own opinion most architects do not know how to build; that is, those who design flat buildings and dwelling houses. Steel structures I admit require men specially educated for this work, but for the ordinary flat buildings, stores and dwelling houses, no architect can beat the old-time carpenter, and that is the reason I regard the present law as obnoxious, as it hinders the builder in his freedom.

In concluding this letter, I desire to state that the Correspondence Department of the paper is, in my estimation, the most valuable feature of the magazine. The plans and drawings are fine, but we very seldom, if ever, have use for them, for as a rule they relate to houses too expensive for this locality. The Correspondence Department, however, is valuable to those engaged in the building business, especially when contributors like Mr. McCullough put in their say. May there be more like him, please

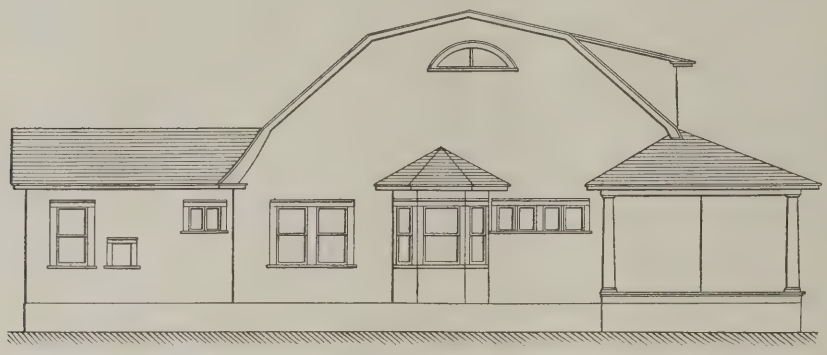
MITERING RAKE AND LEVEL MOLDINGS

From G. L. McMurphy, Tacoma, Wash.—I notice that in my reply to the request of the correspondent asking how to miter level and raking moldings and which appeared in the January issue of the BUILDING AGE I made a serious mistake in the paragraph of the second method of finding the cuts for a miter box. In Fig. 2 of the article the line a-b should be made equal to the width of

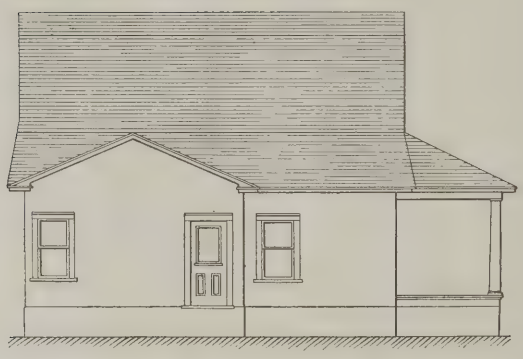
the box and not 12 in. in length, as stated. The mistake is wholly mine and I hope the correction will be in season to prevent anyone from being misled by it.

ELEVATIONS FOR NOVEL FLOOR PLAN

From V. H. Fontaine, Architect, Cleveland, Ohio.—In the Correspondence Department of the BUILDING AGE for November last, there appeared a request from a correspondent in Red Wing, Minn., asking for elevations for the floor plan there presented. A feature of this plan was the diamond shape of the living room and the irregular outlines of some of the others. I am sending herewith drawings showing various elevations which I trust will meet his requirements.



Left Side Elevation of the Building—Scale 1/16 In. to the Foot



Rear Elevation—Scale 1/16 In. to the Foot



Front Elevation—Scale 1/16 In. to the Foot



Right Side Elevation of the Building—Scale 1/16 In. to the Foot

MAKING WOOD GUTTERS AND SPOUTS WATER TIGHT

From R. H. C., Windsor, Nova Scotia.—I would like to ask the practical readers of the paper for the best method of making water tight joints in wooden gutters and spouts. I find that bits of sheet lead tacked over the joints are not satisfactory as the frost will draw the copper tacks and the water works under. A better way I find is to make the joint tight and put in thin white lead; even then, they will leak after a few years.

FORMULA FOR MAKING PUTTY

From W. K., Highland Park, Ill.—I would say to "M. E. H.," who asked in a recent issue regarding a formula for making putty that in order to

make the putty stick the work should always have a priming coat which must be dry before puttying, or at least a coat of linseed oil, preferably boiled. Good common putty is made of chalk (whiting) and linseed oil. This can be strengthened by adding a small amount of white lead. Wagon makers use a putty composed of red lead and linseed oil, which in time becomes about as hard as granite.

QUESTION IN BUILT-UP GIRDER CONSTRUCTION

From W. K., Highland Park, Ill.—Referring to the question of "C. A. C." regarding built-up girder construction, I would state that in order to give the greatest strength in a beam of this kind the plank should be long enough to reach two spans, that is 21 ft., making two joints over each column. This method has two advantages. It makes a continuous girder and it gives the strength of a four plank girder supported at both ends and loaded in the middle plus the strength of a two plank girder supported in the middle and loaded at both ends.

"FORM" FOR CONCRETE CURB AND GUTTER

From Hee. H. See, East Sacramento, Cal.—A few years ago, when the writer was working as bridge and building fireman for a railroad company,

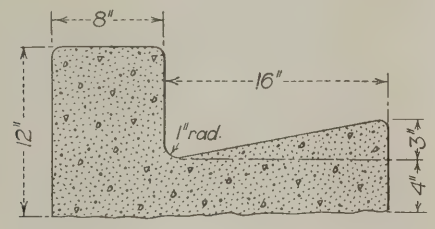


Fig. 1—Section of Concrete Curb and Gutter

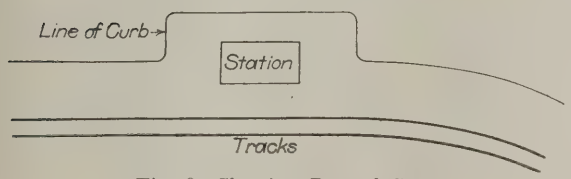


Fig. 2—Showing Run of Curb

we used a considerable quantity of the concrete curb and gutter shown in sectional elevation in Fig. 1 of the sketches.

This curb was used around the passenger stations as a stop for vehicles backing up to the platform with passengers, baggage, etc., and also served as a retaining wall for the oil-macadam platform.

The curb was often from 400 ft. to 500 ft. in length and it ran around to the rear of the station building as well as extended along the tracks as shown in the diagram Fig. 2. There were always four quadrant corners of 4 ft. radius, as shown in the diagram, and sometimes more, depending upon the shape of the building. The curb at the end of the building followed the line of the tracks, curved or straight, whichever they happened to be.

For reasons which it would be too tedious to mention here, most of this small concrete work was done by the ordinary carpenter gangs, the average gang consisting of about eight carpenters and four laborers. The orders from the office were, that the curb was to be mixed and placed in one piece. That is, we could not do as the sidewalk contractors usually does—put in the curb first and then butt the gutter against it, but must arrange the "forms" so that both curb and gutters could be finished at the same time.

The style of "form" we used is shown in Fig. 3. We first drove a row of stakes at the correct distance for the back of the curb, setting them about 2 feet apart. The stakes were set to a line if the curb was to be straight and measured from the track rail with a rod if it was to be curved. The second row of stakes was set by measuring from the first row with a square-ended board, cut the correct length to fit between them.

The cross pieces were next fastened in place and braces were affixed to the "form" here and there to straighten out the crooks. The "form" being low, not much bracing was needed, neither did the stakes require to be driven into the ground for more than a few inches. Notice that the cross pieces are fastened an inch or so above the upper edge of the "form"; this is to enable the top of the curb to be finished off without removing the "form."

The boards for the outside of the curb and gutter were next fastened in place and the board for the face of the curb rounded off on the lower

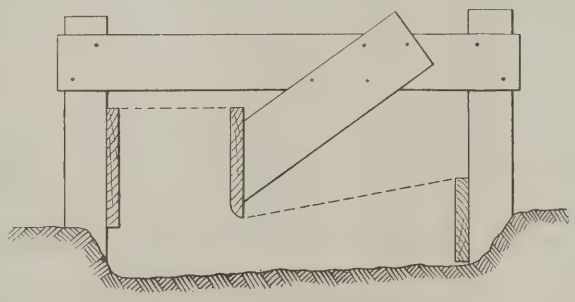


Fig. 3—Appearance of the "Form" Used

edge as shown. The brackets, or braces, that hold this board were first fastened to it and then it was lifted into place and the other ends of the braces nailed to the cross pieces. For adjusting this board into position two pieces of square-ended board 8 inches wide were used. They were held between the front and back of the "form," the squared end being kept flush with the upper edges.

The concrete was mixed by hand in the usual way and the "form" was filled to within about ¾-in. of the top. The remainder of the "form" was filled (while the concrete was still wet) with a

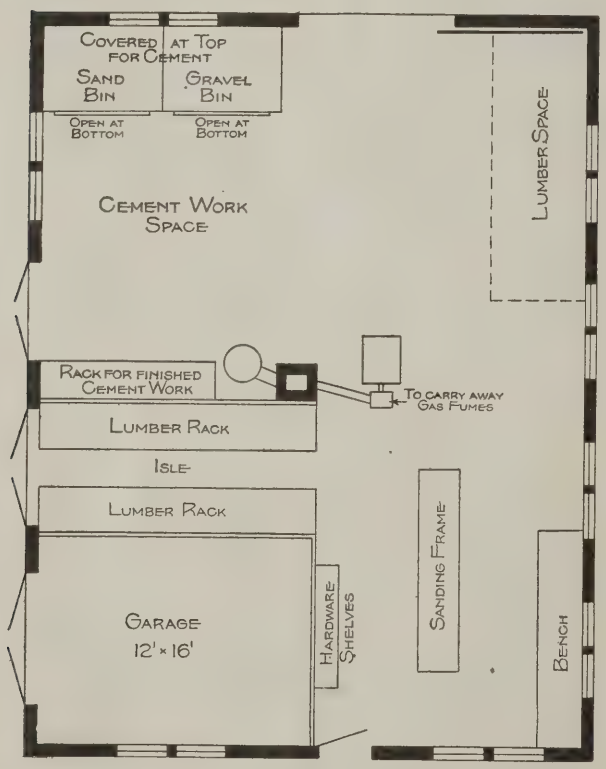
sand and cement mortar which was troweled smooth as we went along. A cornering tool of 5/8-in. radius was run along the edges of the "form" and the latter being taken off while the concrete was still green permitted any smoothing off, or touching up, to be done easily.

For the quadrant corners, we cut a 1-in. board to the curve required and nailed a strip of sheet iron 8 in. wide around it. The strip of iron was stiffened with triangular wood brackets that were nailed to the under side of the curved board.

It is not likely that the scheme outlined in the foregoing will be of great assistance to the concrete contractor, but it may contain a few ideas for others who occasionally have this class of work to handle.

WORKSHOP OF BUILDING CONTRACTOR

From Walter L. Tish, Coshocton, Ohio.—In accepting the invitation of the editor to readers of the Correspondence Department of the paper as expressed in a recent editorial, I am sending a sketch showing the floor plan of my shop, together with the general arrangement of the machines with



WORKSHOP OF A BUILDING CONTRACTOR

which it is equipped. The building is 32 ft. wide and 42 ft. deep, with yard room at the left measuring 18 x 32 ft. The walls of the shop are of brick and the roof is of slate. It has a hip-truss roof, cement floor, plastered ceiling and twin windows, as may be noticed from the drawing. In the front left-hand corner is a garage 12 x 16 ft. to house the motor car which I use in my business. Beyond the garage are two lumber racks, which are supplied through double doors at the left. The rear portion of the shop is devoted to cement work, and there are bins for sand and gravel as well as a rack for the finished cement work.

I have an "Eveready" machine, which is certainly a valuable addition to the up-to-date carpenter shop. It is now operated by gas engine, but I would recommend an electric motor for power owing to greater convenience, and then again on account of handling gasoline in a shop where there is any fire the risk is altogether too great to leave with most workmen, as they do not realize that in a closed room they are liable to have an explosion. I have a Schlueter floor-cleaning machine driven by electric motor, which I use a great deal for cleaning finish. This I do by making a frame to hold the finish form after going over with a sander. I take a weighted box with fine paper on the bottom and run it with the grain of the wood a few times, which makes it equal to any hand finish, and is all done by common labor, making a saving of $1.75 per day while getting out four times as much work as can be done on the bench.

PLUMBING SYSTEM FOR FARM HOUSE

From G. A. L., Edmonton, Alberta.—I have been a subscriber to THE BUILDING AGE for a number of years and have found much in its columns to greatly benefit me. I am now coming to the readers for information. I am expecting to build this summer a farm house 30 x 32 ft. in plan, two stories in height and to have modern plumbing installed in it. The water supply will be drawn from a well near by and the sewage will be run to a cesspool. Will some of the readers kindly furnish through the Correspondence Department plans for the plumbing system, as this may be of interest to other readers besides myself?

PLANS WANTED FOR THREE FAMILY HOUSE

From R. H. C., Windsor, Nova Scotia.—I have been a reader of your most valuable journal for some time past and now desire to ask some of my brother chips if they will furnish for publication sketches of a three-flat house. Buildings of this kind are new in this section and I am thinking of erecting one.

A DIFFICULT PROBLEM IN ROOF FRAMING

From D. D., Edmonton, Alberta.—I am inclosing sketch of roof plan, Fig. 1, in answer to the suggestion of "C. J. M." in the February issue of THE BUILDING AGE. I would like very much indeed to have criticisms from the correspondent in question and also learn just the manner in which he himself solved the problem.

From O. K. Snyder, Instructor in Drafting, Hampton Institute, Virginia.—Referring to the

diagram presented by "C. J. M." of St. Johns, Newfoundland, in the February issue of THE BUILDING AGE, I wish to submit the accompanying plan, Fig. 2, and the elevations, Fig. 3. The pitch on the entire roof is 9 in. rise to 12 in. run except at the northwest corner, where both hips extend to the ridge.

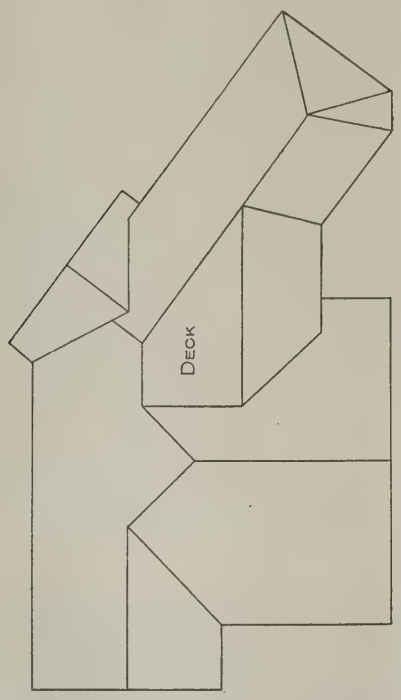


Fig. 1—Plan Submitted by "D. D.," Edmonton, Alberta

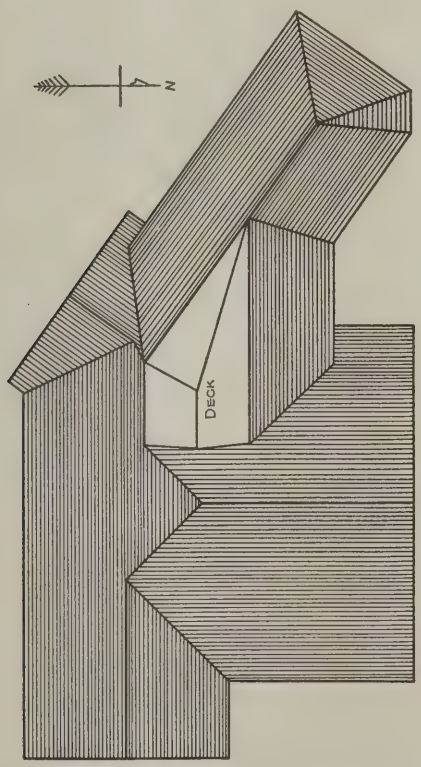


Fig. 2—Roof Plan as Suggested by O. K. Snyder

Will "C. J. M." kindly publish plan and elevations of the roof as it will be built? I know of a number of readers of the paper who are interested in his query.

From J. A. E., Kiron, Ia.—I am sending a diagram of roof framing Fig. 4 as my solution of the problem submitted by "C. J. M.," St. Johns, Newfoundland, and published in the February issue of the paper. I have not had problems like this in actual work, but I am sure it would be interesting as well as good practice to build a similar roof and figure out the bevels, cuts and lengths of the different members. If my solution is incorrect, I should like to hear from "C. J. M.," telling me wherein I am wrong.

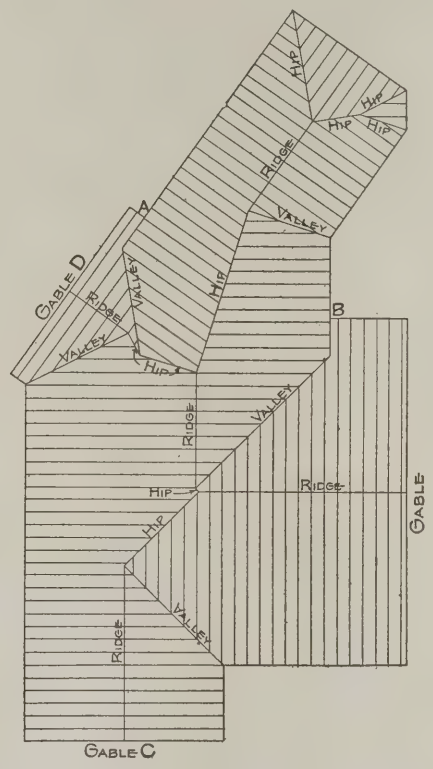


Fig. 4—Solution Proposed by "J. A. E.," Kiron, Iowa

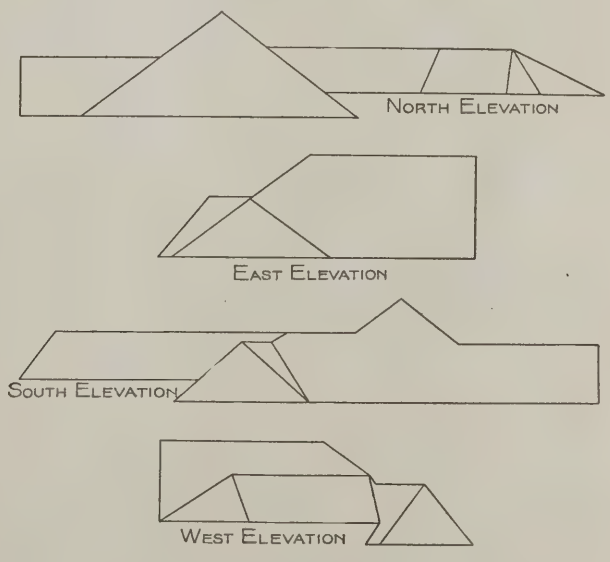


Fig. 3—Elevations Accompanying Solution of O. K. Snyder

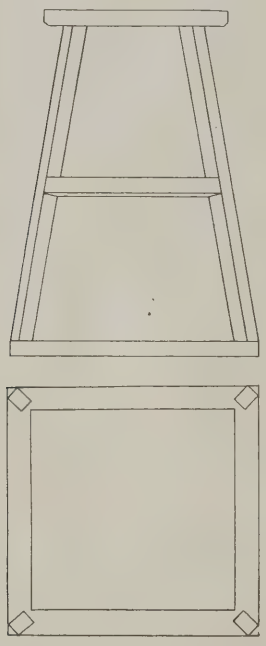
Note.—We have additional solutions to this roofing problem which we shall publish in the next issue of the paper.—[Editor.]

A QUESTION IN "BATTERED" FRAMING

From G. L. McM., Tacoma, Wash.—I wish to compliment "C. J. M." on his answer to the inquiry of "J. F. M.", as published not long since. It was one of the plainest and simplest explanations of a somewhat puzzling problem that I have ever seen in the BUILDING AGE.

I submit the following as a slightly different way of framing the same kind of a structure, differing from that of "C. J. M." in that the posts are set parallel with the diagonal of the foundation instead of the way shown on his plans. Fig. 1 represents the plan of a square foundation and the position of the feet of the posts. Fig. 2 shows an elevation of one side.

The cut of the feet of the posts will be similar to the cut of the foot of a hip rafter of the same pitch—in this case assumed to be 3-in. "batter" to 12-in. rise, making the cut the diagonal of 3 x 3 or 4¼ in. on the tongue and 12 in. on the blade of the square; cut by the tongue. The cut will, of course, be square across the post. This is shown at Fig. 3, where the foot of the post is indicated and also a plan of one corner of the foundation showing the position the foot of the post will occupy. I have assumed that the posts will be placed with the corners flush with the edge of the sills, but if it is desired to bring them out to the corner of the foundation the dotted lines indicate the position they will occupy and also show at *a*, *b*, the amount to be beveled off for backing.



Figs. 1 and 2—Elevation and Plan of a Square Foundation and the Position of the Feet of the Posts

The method of finding the cut for the girder is shown in Fig. 4. The girder, however, is shown as 6 x 12 instead of 12 x 12, as on the elevation. This is for convenience in illustrating. Place the square on the stick in the position of the "batter" given the side of the structure—in this case 3 in. to the foot or 6 in. to two feet—and lay off the size of the girder, as at 6 and 12. Square over from 6, the corner of the square, and 12, as shown. Square across the face and top of the girder, as at A, B, C. Then from C lay off the distance 1, 2, as at C, 1′, and from A lay off the distance 2, 3, as at A, 3′. The lines 1′, B, 3′ will then give the cut on the face and top of the girder. The lines on the back and bottom of the stick are shown by the dotted lines and are found, if desired, the same way.

It will be noted that this cut is the same as that needed to cut a purlin plate against a hip rafter, and the same method can be used for that cut. It can also be used to find the cuts for mitreing any two timbers together where they set at any pitch. I do not claim this method as being original with me, as I found it in *Carpentry and Building* twenty-five years ago—February, 1891, to be exact.

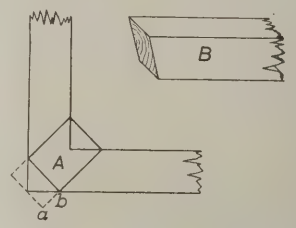


Fig. 3—View of Foot of Post, Also Plan of One Corner of Foundation Showing Position the Foot of the Post Will Occupy

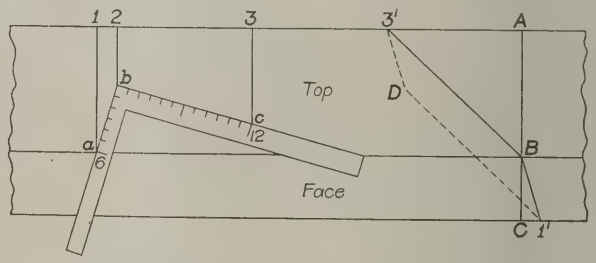


Fig. 4—Method of Finding the Cut for the Girder

It does not occur to me that the framing of the tops of the posts will present any difficulties after these cuts have been mastered.

This is not presented as being better than the method of "C. J. M.", but as just another way to solve the same problem.

WATERPROOFING A CONCRETE PIT FOR HEATING BOILER

From R. S. G., Jamestown, Pa.—Will someone please inform me the best way to build a waterproof concrete pit for a steam-heating boiler? The place where it is to be built is likely to fill up with water as there are springs in the ground. The bottom of the boiler pit must be sunk below the level of the cellar floor in order to get the piping to run as it should. I would be glad to know of some way to keep the water out.

NEW YORK'S COMPLETE BUILDING SHOW

DESCRIPTION OF PROMINENT EXHIBITS AND FEATURES WHICH HELPED TO MAKE THE SHOW A SUCCESS

IN spite of unfavorable weather conditions and the loss of several excellent exhibits due to freight congestion, the National Complete Building Exposition enjoyed a success that caused nearly all the exhibitors to immediately reserve space for next year. The exposition was held at the Grand Central Palace in New York City from March 5 to 11, and the select attendance was a source of much gratification to the management.

The initial Building Show was, it will be remembered, held in Cleveland from February 16 to 23 of last year, being the first of its kind ever held in this country. The many advantages offered by New York City resulted in its being chosen this year as the scene of the event, and it has been definitely decided to hold the next exhibition at the same place in 1918, probably during the first week of April. Plans are already under way tending to make the third show eclipse the two which have gone before.

Each day of the exhibit bore some special title, and moving pictures were shown every afternoon and evening on subjects pertaining to the building industry, lending an added interest. Not the least of the entertaining features were the various addresses delivered in the conference room and including such subjects as "Municipal Fire Prevention," by J. O. Hammitt, chief of the Fire Prevention Bureau; "Tests of Building Materials by the Building Department," by Rudolph P. Miller, chairman of the Board of Standards and Appeals; "Automatic Sprinkler Protection," by Ira G. Hoagland, secretary of the National Automatic Sprinkler Association, and "Terra Cotta as a Building Material," by H. B. Thomas, engineer of the National Fire Proofing Company.

On "Lumber Dealers' Night" the addresses included "Service as Applied to the Lumber Industry," by E. A. Sterling; "Procuring a Woodwork Which Satisfies," by R. H. Brooks; "The Red Gum Industry," by J. N. Pritchard; "Uses of North Carolina Pine," by George W. Jones; and "Reinforced Concrete," by J. P. H. Perry.



FIG. 1—BOOTH OF THE SOUTHERN CYPRESS MFRS. ASSOCIATION SHOWING MODELS OF TWO ATTRACTIVE BUNGALOWS IN WHICH CYPRESS HAS BEEN USED

A variety of building materials, machinery and other things of special interest to builders, architects and prospective home owners were featured, including products of many of the largest concerns in this country.

One of the most interesting exhibits was that of the Southern Cypress Manufacturers' Association, which displayed two models of houses built from cypress, one of them being completely furnished. In the foreground of the display, as indicated in Fig. 1 of the illustrations presented herewith, were

samples of cypress finished in various styles so as to show the beauty of the wood. At the rear and sides of the booth were diverse views of interest to cypress users. At the rear of the booth were pieces of cypress which had survived lengthy use, including



FIG. 2—COMBINATION BOOTH OF BEAVER BOARD AND CREO-DIPT SHINGLES

a piece of cypress from an old Egyptian mummy case 3000 years old; also shingles, fence rails, etc., which had stood the test of time. An old piece of water pipe made from cypress was also exhibited, and it is said that in the original water system of New York City use was made of pipes of this material, pieces of which are in the possession of the company.

An exhibit in which the Beaver Board Companies and the Creo-Dipt Company co-operated caused much favorable comment. The exterior of this booth was covered with Creo-Dipt shingles, the roof having the popular thatched roof effect, as shown in Fig. 2 of the pictures here presented. The interior was finished with Beaver Board, the appearance being highly creditable to the product. This booth made itself especially popular by distributing pencils and toy balloons.

The beauty of the pergola was featured in the exhibit of the Hartmann-Sanders Company, and the excellence of design and workmanship of the subject presented is indicated in Fig. 3 of the accompanying illustrations. The company also had on view many photographs showing how their product had been used to advantage by various architects.

The National Lead Company was represented, and its products were well displayed.

A model of a large country home was exhibited by the Southern Pine Association, it being attractively placed in a miniature garden.

The National Lumber Manufacturers' Association gave an exhibit containing features of special interest to the lumber industry. Thin sheets of various woods were placed in frames and lighted from behind, so that the grain of the wood was prominently displayed to excellent advantage.

The Gum Lumber Manufacturers' Association displayed to good advantage the striking beauties of Red Gum for building purposes. Panels and excellent carving gave a touch of refinement and artistry to this exhibit, which was greatly admired.

The slate industry was represented by the Bangor Slate Association, the display showing some of the many uses to which the product is put.

The Keasbey & Mattison Company gave an excellent display of their asbestos products, and including "Century" shingles, building lumber, corrugated sheathing, building felts and millboard, and several pipe coverings. New to many was the corrugated wire glass shown, and which is intended as a substitute for skylights—making an excellent feature for use in connection with asbestos corrugated sheathing.

An exhibit that was the center of much interest was that in which the Elliot woodworker, a portable electrically driven machine for the use of carpenters and builders, was actively demonstrated by a representative of the maker—the Elliot Woodworker Company, Limited, of Toronto, Canada. This machine operates on the principle of the swing saw, the work being stationary instead of pushed through by the workman as is ordinarily the case.

Vulcanite Asphalt Shingles were exhibited by the Patent Vulcanite Roofing Company, and small samples of the various styles and weights were given out to interested visitors.

R. E. Brooks exhibited various products which he handles, including a concrete mixer made by the Koehring Machine Company, the C. H. & E. portable



FIG. 3—PERGOLA AND COLUMN WORK OF HARTMANN-SANDERS CO.

saw rig made by the C. H. & E. Manufacturing Company, Inc., and a large oil burning salamander made by the Scheu Orchard Heater Company.

The Art Stone Company showed some of its concrete specialties, such as lawn vases, plant boxes,

sun dials, fountains, etc., which were of more than usual interest to users of concrete.

Colors of all sorts and descriptions were featured in the exhibit of the Bridgeport Wood Finishing

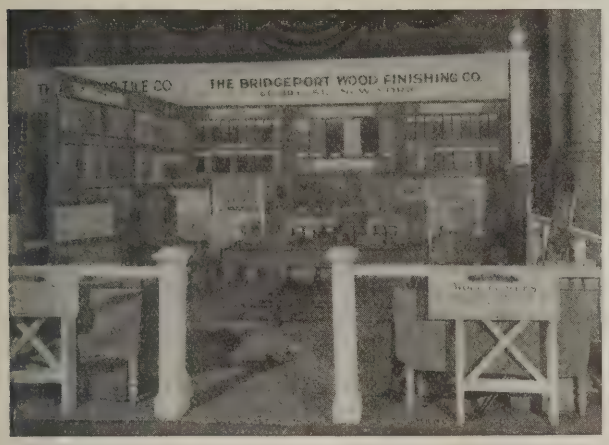


FIG. 4—ATTRACTIVE BOOTH OF THE BRIDGEPORT WOOD FINISHING CO.

Company, which gave an excellent idea of the extensive line of wood finishes manufactured by this concern. The picture which we present in Fig. 4 gives an idea of how valuable this exhibit was to the man interested in this particular branch of the building business.

The Bishopric Mfg. Company showed how Bishopric Stucco Board can be used as a backing for



FIG. 5—BOOTH SHOWING THE APPLICATION OF BISHOPRIC STUCCO BOARD

shingling, stuccoing, brick veneer, etc. The scheme of this exhibit was to not only show the surface covering but also to leave a part of the Stucco Board bare so that its use might be better understood by the interested visitor. Stucco with a "pebble-dash" finish formed the back and sides of the exhibit, and constituted the most prominent feature of the display, as shown by Fig. 5 of the illustrations.

An exhibit participated in by the Seattle Cedar Lumber Mfg. Company and the Triumph Column Company, featuring Maltese Cross Cedar Lumber and Triumph Lock-Joint Columns, attracted much attention, as it set forth the merits of those products with excellent taste.

Near the entrance stairway was a joint exhibit of the Sandusky Cement Company and of the Stonecrete Company, and here were featured Medusa waterproof white cement and models made from it. The various models were beautifully done, and their exquisite color excited much comment. Fig. 6 of the illustrations gives some idea of this very attractive exhibit.

Near by was the brick exhibit of the Hay Walker Brick Company, which showed various kinds of brick



FIG. 6—BOOTH OF "MEDUSA" WHITE CEMENT

laid up in different patterns, as indicated in the picture Fig. 7. A number of different brick manufacturers were represented in this exhibit, and their varied products lent to many a new significance to the slogan, "Build with Brick." The work was beautified with vines, ferns, etc.

In this section also was one of the two booths occupied by THE BUILDING AGE, and our subscription



FIG. 7—AN ARTISTIC DISPLAY OF BRICK WORK

representatives reported many enrollments from far distant points, indicating both the popularity of the magazine and the manner in which the Exposition drew people from all over the country. It is of in-

terest to note that a surprisingly large number of visitors reported that they had files of THE BUILDING AGE running back fifteen years or more and some even to the first number printed in 1879.

Herman Vossnack, Jr., Inc., showed some interesting features in flooring, of special interest being long leaf comb grain yellow pine parquet flooring, rift sawn. This was laid in panels to show the beauty of the effect gained by the varying shades of the lumber. Hardwood flooring manufactured by the Dwight Lumber Company was also shown.

Blinds for special use with casement windows, also folding partitions, etc., were exhibited by the J. G. Wilson Corporation.

Of value to those interested in concrete houses was the exhibit of Morrill Moulded Concrete Houses, which included models of houses built by this system and also a display of the "forms" used.

The Indiana Limestone Quarrymen's Association was well represented, and a crowd of visitors was usually watching the men who were shaping the stone into various designs.

Of interest to New Yorkers was the model of Riverside Park and Drive, from 72d Street to 153d Street, which was given on the scale of 20 ft. to the inch, and showing how the proposed improvements would beautify present unsightly conditions.

A special section of the building was devoted to the showing of the prize designs of houses costing under $5,500. Photographs and scale drawings were exhibited, there having been more than 3000 designs submitted to the committee.

Pictures of the exhibits were made by the Official Photographers of the Exposition—the Ohio Commercial Photograph Company, by whose courtesy we are able to present these illustrations.

AN ELECTRICALLY EQUIPPED BUNGALOW

An electrically equipped bungalow has been built and furnished by the Sterling Electric Company, 33 South Fifth St., Minneapolis, Minn., for the purpose of demonstrating in actual use a line of electrical household conveniences. In the dining room is a complete line of electric toasters, percolators, chafing dishes, grills, etc.

The kitchen is equipped with an electric range, electrical fireless cooker, combination electrical dish washer and drier and electric coffee grinder, and an electrical polishing, sharpening and utility motor.

The bedroom is equipped with heating pads and an electric blanket. On the dresser is found a milk warmer for the baby. The dressing table is equipped with massage vibrator, hair drier, and curling iron.

The electrical bath room appliances shown are disc stoves and immersion heaters for heating water and other liquids, and electric shaving mug and massage machine.

The laundry room displays a washing machine and ironing machine, as well as an automatic electric ironing board, upon which are displayed Ideal, General Electric, Rochester and Universal irons. An electrical clothes drier completes the laundry.

In every room are placed wall outlets for convenience of attaching electric fans, and also baseboard receptacles upon which can be attached a vacuum cleaner.

CHART SHOWING FOURTEEN YEARS' BUILDING OPERATIONS

The amount of building construction planned during a series of years is always an interesting theme for discussion owing to the fact that so many allied industries are dependent for their activity upon the amount of new construction work for which permits are issued. With a view, therefore, to determining the value of building permits issued during a stated period the Atlantic Company, makers of "Crown"

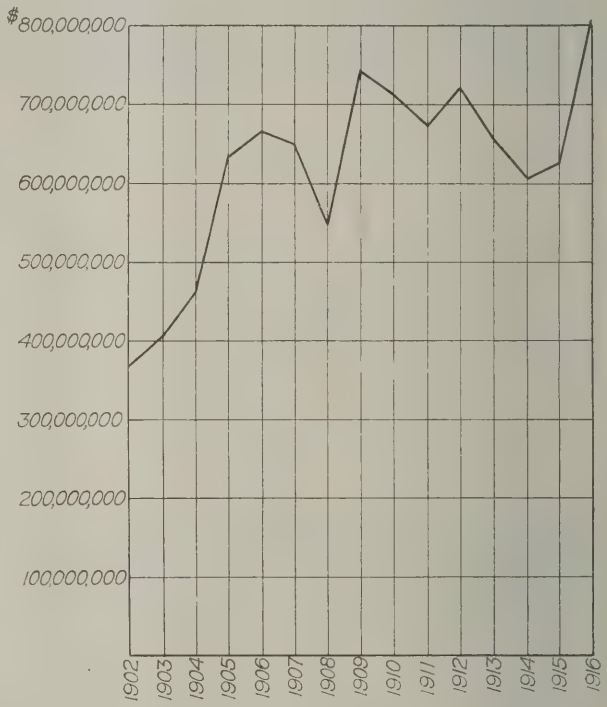


CHART SHOWING 14 YEARS' BUILDING OPERATIONS

"Crescent" sash chain, Brooklyn, N. Y., has just compiled a chart showing fluctuations in the estimated cost of building improvements for which permits were issued in forty of the largest cities of the United States during the period from 1902 to the close of 1916. Through the courtesy of this company we are enabled to present a facsimile of the chart herewith.

In commenting upon the volume of building operations the company points out that in connection with the results for the year just closed, it is not thought probable, in spite of the sharp upward bend in this curve, that there has been any increase in the cubic feet of buildings erected because it must be remembered that the unprecedented jump in prices coupled with the large increase in building permits issued in New York City last summer prior to the enactment of the new building limitation ordinance will easily account for most of the increase shown which for the forty largest cities used in connection with the chart is over 28 per cent.

New Publications

Modern Underpinning. By L. White, C.E., and E. A. Prentis, Jr., M.E. 94 pages. Size 5 by 9 in. Illustrated by photographic views and drawings. Published by John Wiley & Sons. Price $1.50.

The subject of underpinning has made great advances within the last few years owing to the problems which arose and were overcome during the construction of the New York City subway. The vast loads which had to be supported in the downtown district without interrupting business or without placing obstacles in the streets caused many engineering feats to be performed. The authors of the volume under review have had unusual opportunities to gather valuable first-hand material from the firm who handled the largest amount of the underpinning work in the subway. Furthermore, during the process of construction on William Street throughout two years, photographs were taken to show the essential steps, these pictures in the book being supplemented by drawings and scientifically altered photographs. Enough text has been added to supplement the illustrations and to make the book a valuable one upon modern underpinning methods as practised when difficult problems are under solution.

Carpentry. By Ira S. Griffith. 188 pages, size 5½ x 7¾ in. Illustrated. Bound in cloth. Published by the Manual Arts Press. Price $1.00.

The book under review is an important addition to the literature upon elementary carpentry, and the essential fundamentals of the trade are described in clear, understandable language. The description starts at the very beginning of a building operation, stating the manner of setting the batter boards and the instruments used therefor; construction of footings and foundations together with the materials which may be used, waterproofing, basement frames, etc.

Chapter 2 takes up the details of the main frame, showing the various styles of framing sills, girders, trimmers and headers, corner posts, partitions, etc. Chapter 3 deals with the underlying principles of roof framing and their various applications; directions for finding plumb cuts, side cuts, etc.; methods for finding rafter lengths, and other important things of a similar nature. Chapter 4 is entitled "Roof Frame: Any Polygon," and lucid explanations are presented thereon.

Chapter 5 states the manner of applying the exterior covering and finish, such as sheathing, cornices, raked moldings, shingling, flashing, setting door and window frames, siding, scaffolding, etc. Chapter 6 describes the details of interior finish, going into the placing of grounds, stair building, porch framing and finish; hanging, fitting, and hinging doors; details of door and window frames, etc. Estimating is treated in Chapter 7, and the grades of lumber, average time taken to do various pieces of work, costs thereof, etc., are given.

The appendix shows trigonometric functions applied to carpentry, and in connection therewith the author states that his experience has shown that students can grasp the necessary principles with less effort than is usually expended upon the square root. Useful tables of screw sizes, length and number of wire nails to the pound, a table of board measure, table of strength of materials, short cuts to roof framing, etc., are also presented in the appendix.

Illustrations are numerous, and consist of reproductions of photographs and drawings, making the work well adapted as a textbook for trade apprentices, students in vocational and trade schools, etc. The author is an experienced carpenter and contractor, and is chairman of the Manual Arts Department of the University of Missouri.

Heating and Ventilation. By L. A. Harding and A. C. Willard. 615 pages, size 7 x 9¼. Illustrated. Published by John Wiley & Sons, Inc. Price, $4.

The heating and ventilation of a building are two of the most important factors contributing to the health and efficiency of the inmates. Although the subject is somewhat out of the builders' regular line, yet the successful man is the one who is generally conversant with all branches of the trade called upon to complete the structure.

The book under review is one which is very comprehensive and is the first volume of a series entitled "Mechanical Equipment of Buildings." The object of the authors was to produce a reference book for architects and engineers which should contain sufficient theoretical and commercial data for practical use in designing and at the same time serve to show the student the relation between the theoretical principles involved and their application to actual problems. Some of the subjects treated are electrical heating, direct and indirect steam and hot-water heating, heat transmission of direct radiators, heat transmission of building construction, ventilation, air analysis, ventilation laws, cost of equipment and preparation of plans and specifications, together with many other subjects of value.

Roof Framing Tables. By Ira S. Griffith. Published by The Manual Arts Press. Price $1.25.

These tables are for use in roof framing either by means of the steel square or protractor and are accompanied by a booklet giving directions for their proper use. Their purpose is to provide in a condensed form information for framing roofs of all shapes and sizes. The tables are of celluloid and are contained in a case for protection in handling.

Reports which reach us from Akron and Canton, Ohio, indicate preparations for an unusual amount of small dwelling house construction the present season. Permits have been taken out for hundreds of houses of the small type and hundreds have already been erected to meet the growing demand for housing accommodations.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS IN FEBRUARY SHOW 4.7 PER CENT DECREASE FROM FEBRUARY, 1916

NOTWITHSTANDING the very marked increase which has recently taken place in the cost of all kinds of materials entering into building construction, and thereby raising the expense of new construction work to that extent, the amount involved in the improvements for which permits were issued in 109 cities of the country in February represents a decrease of 4.72 per cent as compared with the same month of 1916. This is the first time in more than a year that the showing has been a decrease rather than an increase when contrasted with the corresponding period of the year before. A significant feature of the reports at hand is found in the fact that every section of the country except the Eastern zone shows a loss in the value of its new construction work.

Of the 39 Eastern cities reporting, 20 indicate an increase over a year ago, while 19 show a decrease, with a resultant gain of 1.24 per cent. This is due in large measure to the increased activities in Erie, Newark, New Bedford, the boroughs of Manhattan and Richmond of Greater New York, Philadelphia, Trenton, Schenectady, Worcester and East Orange. The accompanying table clearly shows the relative cost of improvements projected in the cities reporting for the two periods named.

CITIES IN EASTERN STATES

	February, 1917	February, 1916
Albany	$300,740	$169,230
Allentown	39,925	192,000
Atlantic City	194,912	143,910
Bayonne	69,450	24,545
Binghamton	156,931	165,910
Boston and suburbs	3,303,000	4,591,000
Brockton	36,000	30,850
East Orange	137,994	31,325
Elizabeth	58,705	85,106
Erie	138,315	87,455
Harrisburg	10,895	31,460
Hartford	144,010	387,820
Hoboken	74,100	613,753
Holyoke	77,000	75,250
Manchester	61,625	125,055
Newark	512,955	246,838
New Bedford	228,950	48,605
New Haven	133,186	352,040
New York:		
Manhattan	8,572,499	3,452,130
Bronx	586,334	1,649,457
Brooklyn	1,999,165	3,600,693
Queens	900,240	1,880,375
Richmond	318,262	96,805
Passaic	7,550	43,280
Philadelphia	4,042,115	2,437,750
Pittsburgh	241,535	1,321,686
Portland	24,550	50,585
Quincy	62,800	54,535
Reading	9,500	50,150
Rochester	241,861	691,433
Schenectady	285,605	21,476
Springfield	162,242	470,185
Syracuse	201,737	150,373
Trenton	550,845	33,500
Troy	15,831	14,235
Utica	13,165	226,175
Wilkes-Barre	58,878	36,748
Woonsocket, R. I.	39,975	28,125
Worcester	217,990	174,473

In the middle section of the country, 20 of the 38 cities reporting show a loss as compared with last year, the amount being 5.3 per cent. Some of the striking features are found in the figures for Chicago, Dayton, Kansas City, Indianapolis, St. Louis, St. Paul, Toledo and Youngstown.

CITIES IN MIDDLE STATES

	February, 1917	February, 1916
Akron	$965,560	$435,575
Canton	102,900	356,675
Cedar Rapids	40,000	38,000
Chicago	3,657,900	7,354,200
Cincinnati	841,490	596,120
Cleveland	2,784,260	1,552,725

CITIES IN MIDDLE STATES (Continued)

	February, 1917	February, 1916
Columbus	223,655	314,225
Davenport	10,935	23,395
Dayton	1,932,090	99,749
Des Moines	226,160	67,000
Detroit	2,104,270	2,186,960
Dubuque	19,400	1,800
Duluth	158,030	172,172
East St. Louis	240,853	34,320
Evansville	50,288	22,157
Fort Wayne	148,200	74,950
Grand Rapids	61,505	114,740
Indianapolis	522,510	406,531
Kansas City, Kan.	50,500	69,734
Kansas City, Mo.	759,070	464,760
Lima, Ohio	204,900	37,000
Lincoln	66,565	57,800
Milwaukee	783,844	823,178
Minneapolis	323,175	823,960
Omaha	936,925	815,692
Peoria	153,691	200,250
Saginaw	6,775	6,400
St. Joseph	23,820	82,190
St. Louis	916,541	1,180,334
St. Paul	218,044	426,694
Sioux City	92,000	569,400
South Bend	130,822	177,058
Springfield, Ill.	126,090	137,300
Superior	9,395	83,295
Terre Haute	23,060	79,110
Toledo	388,133	700,781
Topeka	23,991	10,575
Youngstown	255,420	85,665

From the Southern section of the country we have reports from 18 cities, of which 11 show a gain as compared with a year ago, but with a resultant loss of 21.95 per cent for the zone under review. This grew out of the heavy falling off in operations in Baltimore, Chattanooga and Louisville. On the other hand, marked increases were shown in Atlanta, Jacksonville, New Orleans, Richmond and Oklahoma City.

CITIES IN SOUTHERN STATES

	February, 1917	February, 1916
Atlanta	$493,323	$255,774
Baltimore	323,382	1,438,263
Birmingham	147,257	150,965
Chattanooga	54,371	249,689
Columbia, S. C.	20,073	11,663
Dallas	369,342	216,212
Fort Worth	125,215	84,545
Jacksonville	137,250	27,275
Louisville	185,910	932,340
Memphis	246,785	205,565
Montgomery	15,430	30,080
New Orleans	370,373	116,889
Norfolk, Va:	114,918	104,654
Oklahoma City	163,988	62,580
Richmond	536,532	372,907
Savannah	93,600	96,520
Tampa	42,550	75,395
Wilmington	51,355	42,332

In the extreme Western section of the country we have reports from 14 cities, of which only 4 show a gain in the amount of new construction work planned, but with a total resultant loss of 15.92 per cent. Heavy decreases are reported from Berkeley, Denver, San Francisco, Pueblo, Salt Lake City and San Diego, while notable increases are found in Los Angeles, Seattle, Oakland and Portland.

CITIES IN EXTREME WESTERN STATES

	February, 1917	February, 1916
Berkeley, Cal.	$94,300	$210,450
Colorado Springs	10,515	40,835
Denver	248,520	472,380
Los Angeles	1,222,518	976,378
Oakland	366,022	338,336
Pasadena	94,327	96,576
Portland	272,335	169,375
Pueblo	51,194	390,520
Salt Lake City	64,900	243,815
San Diego	67,175	164,890
San Francisco	1,165,220	1,356,915
San Jose	19,583	56,905
Seattle	634,625	598,615
Stockton	42,365	62,335

CURRENT NEWS OF BUILDERS' EXCHANGES

ANNUAL ELECTIONS—NEW OFFICERS—BANQUETS —VARIOUS OTHER MATTERS OF INTEREST

Banquet of Baltimore Builders' Exchange

THE members of the Builders' Exchange of Baltimore, Md., gathered for the annual banquet of that organization which was held on Saturday evening, January 27, in the roof garden of the Hotel Emerson. The room was appropriately decorated with flags, bunting and vari-colored bulbs. An impressive decorative feature was the effects produced by different firms who were members of the Exchange, the table in each instance carrying special decorations. For example, the table of the Consolidated Engineering Company carried a replica in sugar of the Bank of Commerce and Trust Company of Memphis, Tenn., and this was awarded first prize. Chesapeake and Potomac Telephone Company's table had an illuminated bell with connected telephones. The table of the Master Plumbers' Association had an illuminated fountain.

Secretary I. Herbert Scates discharged the duties of toastmaster, and after an elaborate menu had been properly considered, the speakers of the evening were introduced. The address of welcome was delivered by President A. J. Dietrich, after which John Trainor, president of the National Association of Builders' Exchanges, spoke in regard to that organization; United States Senator Hoke Smith of Georgia had something to say about the worth of the Federal Reserve Bank system; Congressman Frank Clark of Florida and chairman of the Committee of Public Buildings, made some interesting remarks on the public building question which is now being agitated and which, in his opinion, is so greatly misunderstood by the people.

On behalf of the Builders' Exchange, Robert E. Lee, secretary of Major Preston, presented prizes in a chance in which all of the guests at the tables participated.

Cleveland Exchange Appoints Standing Committees

President Sam W. Emerson recently completed the full roster of the regular standing committees for the year and they have been approved by the Board of Directors. The following are the names of the different committees and the chairman of each:

Finance—E. W. Farr, chairman.
Legislative—A. C. Klumph, chairman.
Entertainment—R. G. Pate, chairman.
Trade Education—E. W. Palmer, chairman.
Rooms—George A. Rutherford, chairman.
New Members—A. E. Riester, chairman.
Public Buildings—W. M. Pattison, chairman.
Building Code—E. W. Reaugh, chairman.
Cost Accounting—K. H. Pratt, chairman.

New Officers of Montgomery Builders' Exchange

The Builders' Exchange organized last September in Montgomery, Ala., by leading builders and contractors of that city, recently met and elected officers for the ensuing year as follows:

President.....M. W. Stuart.
First Vice-President.....T. L. Bear.
Second Vice-President.....James Hodgson.
Treasurer.....J. M. Jenkins, Jr.
Secretary.....J. M. Holloway.

The Exchange has affiliated with the National Association of Builders' Exchanges, and was well represented at the Convention in Atlanta.

New Officers of Quad-City Builders' Exchange

At the regular meeting of the Quad-City Builders' Exchange held in Rock Island, Ill., on the evening of Thursday, January 18, the following officers were elected for the ensuing year:

President.....A. A. Arnould.
First Vice-President.....Edward Kunkel.
Second Vice-President.....A. E. Horst.
Third Vice-President.....K. I. Willis.
Fourth Vice-President.....G. F. Schilling.
Secretary.....John A. Nelson.
Assistant Secretary.....E. J. Burns.
Treasurer.....F. R. Dewend.

The annual banquet is to be held early in March and a committee has been appointed to arrange details consisting of W. J. Ball, chairman, of Moline, E. H. Fluke of Davenport, John Nelson of Rock Island, and A. G. Schilling of Moline.

Election of Flint Builders' Exchange

At the recent meeting of The Builders' and Traders' Exchange of Flint, Mich., officers for the ensuing year were chosen as follows:

President.....Allen J. Beach.
Vice-president.....Clifton O. Wheeler.
Treasurer.....John Marble.
Secretary.....Paul Heonke.

A Board of Directors was also elected. It is being planned to establish a Permanent Building Exposition at the headquarters of the Exchange. Another noteworthy feature is the appointing, by President Beach, of a committee to consider needed changes in the city's building code, this committee consisting of contractors, architects, material men and other competent persons.

Meeting of Montreal Builders' Exchange

At the annual meeting of The Builders' Exchange of Montreal, Canada, held on January 22, the following officers were elected for the ensuing year:

President.....J. P. Anglin.
First Vice-president.....W. C. Munn.
Second Vice-president.....Robert F. Dykes.

A board of directors was also elected. Retiring President John Quinlan, in his address, touched upon the work which had been accomplished during the year, and stated the success attending the movement for the renting of equipment, which was inaugurated recently.

Election of Minot Builders' Exchange

Officers of the Builders' and Traders' Exchange of Minot, North Dakota, were recently elected for the ensuing year as follows:

President.....C. D. See.
First Vice-president.....Andrew Lantz.
Second Vice-president.....P. J. Connolly.
Secretary.....Will E. Holbein.
Treasurer.....Fred Ernst.

New quarters have been taken in the Jacobson Block, and these have been furnished to meet the requirements of the organization.

Theater Party of Minneapolis Builders' Exchange

The annual theater party of The Builders' Exchange of Minneapolis, Minn., was held on February 6 at the Metropolitan Theater, where 700 members and their guests enjoyed "Katinka." Between the acts Walter Thorp made his appearance before the footlights drawing a child's express wagon in which were two packages. He humorously directed attention to Architects L. A. Lamoreaux, Victor F. V. de Brauwere and George E. Bertrand, and severally presented them with a pair of boxing gloves, the wagon, and an alarm clock, the special significance of each being stated by Mr. Thorp. After the show members went to the Odin Club for light refreshments and dancing.

Election and Banquet of Mankato Builders' Exchange

Fifty members of The Builders' Exchange of Mankato, Minn., recently enjoyed their annual banquet, the addresses delivered being both interesting and instructive. Officers for the ensuing year were elected as follows:

President.....E. A. Carlstrom.
First Vice-president.....Edward Bach.
Second Vice-president...Edward Schumacher.
Secretary.....A. E. Berg.
Recording Secretary.....W. P. Grimes.
Trustee.....G. F. Widell.
Trustee for three years.....Otto Neitge.

The Exchange was organized about a year ago, and has proven very successful if a substantial balance in the treasury may be taken as a criterion.

Builders Organize at Monroe, Mich.

There has recently been organized a Builders and Traders' Exchange at Monroe, Mich., with a membership of twenty. Temporary officers are:

President.....M. D. May
Secretary.....Harry R. McGovern

These officers will serve until rules and by-laws have been drafted and approved.

"Funfest" of Detroit Builders' and Traders' Exchange

The annual "feast and funfest" of the Builders' and Traders' Exchange, Detroit, Mich., was held on February 1, over 500 being present. An excellent dinner was followed by addresses and cabaret and vaudeville entertainment. Toastmaster C. M. Roehm was introduced by President Otto Misch, and the first speaker was Mayor Oscar B. Marx. The mayor spoke upon various public improvements, and then expressed himself upon the recent trouble in the Building Department, saying: "Criticisms of the present city building code are not due to any fault of the commissioners, but rather are due to the ordinance itself. I am going to ask the Builders' and Traders' Exchange to name two of its members to co-operate with the architects' societies, the real estate men and the Board of Commerce in formulating a satisfactory Code."

President Misch agreed to appoint two members, as requested by Mayor Marx.

At the annual meeting of the Builders' and Traders' Exchange the following officers were elected:

President .....Otto Misch
Vice-President.....J. Conrad Brede
Treasurer.....Frank M. Pauli

Charles A. Bowen continues to discharge the duties of secretary and in his report he urged closer cooperation between the contractors and dealers in building materials, pointing out that its necessity had been emphasized during the past year when the price of materials fluctuated rapidly and labor was scarce, so that although the contractors did a large business, the conditions under which they operated were not altogether satisfactory. He stated that during the year 71 new members had been added to the roster bringing the net membership of the Exchange up to 518. He also reviewed the year's work in detail, covering the various methods of the Exchange and announced that the outlook for 1917 was regarded as unusually bright for the building trades in Detroit as well as for the Exchange itself.

Los Angeles Builders' Exchange a Bureau of Information

A Builders' Exchange should be a source of information to the building public in general on all topics relating to the building industry and should paraticularly offer its facilities and accommodations to out-of-town contractors, is the opinion of Secretary H. B. Webster, of the Builders' Exchange of Los Angeles, Cal. Mr. Webster has prepared a circular letter for mailing to contractors throughout Southern California inviting them to make the Exchange their headquarters when visiting Los Angeles and to direct to the Exchange any inquiries they may have relating to materials, subcontractors and dealers.

New Officers of Louisville Builders' Exchange

At the recent annual meeting of the Builders' Exchange of Louisville, Ky., directors and officers for the ensuing year were chosen. The officers are:

President .....J. E. Merrick.
1st Vice-President.....C. C. Childers
2nd Vice-President.....P. M. Wintersmith
Treasurer.....F. A. Clegg.
Secretary.....J. M. Vollmer.

The Scranton Builders' Exchange

The members of the Builders' Exchange of Scranton, Pa., held their annual banquet on the evening of Tuesday, Jan. 16, a very attractive program having been prepared for the occasion. Various speakers discussed topics of interest to the membership and the occasion was one of general good fellowship.

Officers of Milwaukee Builders' Exchange

The Builders and Traders' Exchange of Milwaukee, Wis., held its annual meeting recently, and elected officers for the ensuing year as follows:

President.....Arthur J. Maag
1st Vice-Pres.....William Gregory
2nd Vice-Pres.....Thomas E. Dever
Secretary.....Frank Spetz
Treasurer.....Anton Hennecke

The Builders' Club of Milwaukee, an affiliated organization, elected the following officers:

President.....William Gregory
1st Vice-Pres.....W. G. Williams
2nd Vice-Pres.....William Metzker
Secretary.....Arthur J. Maag
Treasurer.....Anton Hennecke

Each organization also elected directors.

A New Builders Exchange in Montana

A Builders' Exchange has been organized at Bozeman, Mont., and officers elected as follows:

President.....Nels. M. Baverly.
Vice-President.....J. H. Mimmack.
Secretary.....O. E. Long.
Treasurer.....E. L. Bartholomew.

The trustees elected were J. D. Werling, H. S. Hamill and J. B. Cain.





Showing flexible features of "Big 4" Hanger

Are the Farmers in your vicinity "National-ly" Prepared?

If not, it's up to you, Mr. Builder, to supply them with the kind of preparedness they are looking for—namely, barn door equipment. A poor hanger is like a balky horse—it won't work when they most need it.

Improved "Big 4" Hanger

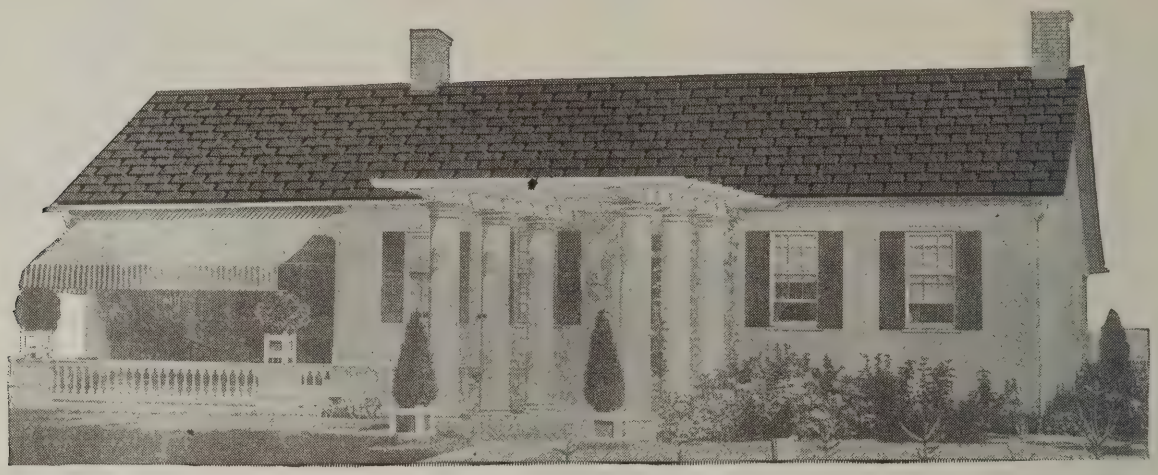
Big 4 Hangers assure barn-door satisfaction. They are easy to attach, flexible and rigid at once, unusually strong and durable, possess the non-binding wheel housing, anti-friction roller bearing, and are prevented from rusting by sherardizing the axles and rivets.

This view at the right shows how impossible it would be for "Big FOUR" to jump the track. Note the wide Swing-Out feature and the hood turned under the rail. The two guide studs make easy fitting to the top of the door with no measuring or mortising to do.

You can't afford to overlook this opportunity for big spring business among the farmers.

Send for catalog and give dealer's name.

National Mfg. Co., Sterling, Ill.



Nature Colored This Roofing a Million Years Ago—

Asphalt Shingles

"The Roof that Stays Young"

ASPHALT SHINGLES owe their beautiful colorings to the crushed rock products which are tightly gripped on their surface. These rock products are imperishably tinted with the richest shades of red, gray, green, brown or black.

These are the *natural colorings* of the rock, just as it was quarried from Nature's workshop. The colorings were unchangeably fixed in them millions of years ago. That is why an *Asphalt Shingle* roof never fades or loses the rich beauty of its colorings.

Cost need never make you hesitate to use *Asphalt Shingles* so as to give your customer's home the beauty and attractiveness that such a roof would give it. For *Asphalt Shingles* cost no more than commonplace roofings. But their handsomeness, long life and everlasting waterproof qualities are putting them on hundreds of thousands of houses each year.

You should recommend and use them if you want your customers to have attractive homes that will be a credit to you, and if you want them to have efficient, moderate priced building materials that they will later thank you for having suggested.

See that you specify reliable quality ***Asphalt Shingles,*** *made with a strong felt, saturated or coated with Asphalt, with crushed rock products tightly embedded on the surface.*

ASPHALT SHINGLE PUBLICITY BUREAU, 954 Marquette Bldg., CHICAGO

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

The Elliot Portable Woodworker

A portable electrically-driven machine which is of more than usual interest to carpenters and builders throughout the country by reason of the many novel features involved is the Elliot woodworker, which runs on the principle of a swinging saw while the work is stationary rather than being pushed through by the operator as is the case with the general run of combination machines. The claim is made that it will cut 24 in. wide by 3 in. thick with a 10-in. saw and 5 in. thick with a 14-in. saw. By lifting the motor and saw carriage off the slide, the machine is easily carried to the lumber pile. The machine is such that it can be set close to the wall and cross cutting and ripping is done on the lumber facing in one direction. It is pointed out that this combination woodworker will successfully cut the housings in stair strings, and will with one cut across produce dadoes and leave a lug on the work such as inside door jambs, pulley stiles and draw fronts. By setting the machine to ripping position and putting on dado heads instead of a saw the operator can do planing and rabbeting. The tilting table allows compound miters such as side cuts of jack rafters to be made, this being an exclusive feature of the machine. An attachment for boring is provided, the bit being adjustable up and down by means of a hand screw. The claim is made that 600 holes for pulley stiles can be bored in an hour and wedges ripped at the rate of sixteen a minute. By removing two thumb nuts the cutting board and brackets may be taken off, allowing the machine to go through a 2½ ft. opening. It is made by the Elliot Woodworker, Ltd., College and Bathurst Streets, Toronto, Ontario, Can., and on this side of the line can be obtained from the Elliot Woodworker Company, Congress and Brush Streets, Detroit, Mich.

Change of Name of Van Guilder Company

Announcement has just been made of the incorporation of a new company to take over the business of the Van Guilder Hollow Wall Company, the new designation being the Van Guilder Double Wall Company, with offices in the Wagner Building, Rochester, N. Y.

Group Picture of Executives and Traveling Salesmen of Milwaukee Corrugating Company

We take pleasure in presenting in Fig. 1 a photo reproduction of a recent group picture of the executives and traveling salesmen for 1917 of the Milwaukee Corrugating Company, Milwaukee, Wis. These men come together once a year to talk over business matters and become acquainted with all the various details of the new goods which the company is turning out in order to meet the varying requirements of a constantly growing trade. A banquet is usually one of the features of these occasions and a spirit of good fellowship prevails. The salesmen returning to their respective territories leave with a feeling and desire to give even better service to their customers than in the past and a splendid enthusiasm is usually a marked feature of the occasion.



Fig. 1—Executives and Traveling Salesmen of the Milwaukee Corrugating Co.

How to Finish and Paint Arkansas Soft Pine

The builder who is striving to keep down the expense of each item entering into the total building outlay, but who is anxious not to sacrifice any substantial or artistic qualities in his interior trim, will find much of interest in "Arkansas Soft Pine; How to Finish and Paint It," which is being distributed by the Arkansas Soft Pine Bureau, 420 Bank of Commerce Building, Little Rock, Ark. This material is said to need no

priming coat and to require less time for finishing than do many of the more expensive hard woods. It is said to be especially adaptable as a base for white enamel. One of the features of the booklet which is likely to prove valuable are the pages devoted to "How to Finish Arkansas Soft Pine Interior Trim," for the requirements of the different finishes were prepared by one of the oldest established varnish makers in the country, and may therefore be regarded as authoritative in connection with this wood. Important also are the pages devoted to the painting and finishing of the wood when used exteriorally. The pages of the booklet have tinted borders, and numerous photographic reproductions, mostly of interiors, showing how well Arkansas soft pine lends itself to beautiful construction constitute another noteworthy feature.

The Miles Auto Trailer

The extent to which building contractors, plumbers, painters and others are making use of the automobile in their business renders more than ordinarily interesting the model of the Miles Trailer, which we illustrate in Fig. 2 of the engravings. This is known as model 10 auto trailer, has steel wheels with two sets of annular ball bearings in each wheel, and a 2-in. solid truck tire instead of inflated tires, and as a consequence no punctures result. The model is also fitted with a 1¼-in. square bed axle, standard 56 in. tread, with heavy springs and spring shackles, drop forge spring links, a steel frame of automobile channel bent to form the tongue and with the makers' all way coupling, together with a combination rack and delivery body 42 x 70 in. in size and 15 in. deep, finished in a Brewster green. This trailer is made by the Miles Company, 304 East Franklin Street, Jackson, Mich., from whom circulars may be obtained relating to the special price at which the trailer is being offered.



Fig. 2—The Miles Auto Trailer

Storm's Electric Dumbwaiters

An attractive Bulletin of electric dumbwaiters and presenting a brief sketch of the goods of this kind turned out by the Storm Manufacturing Company, 52 Vesey Street, Newark, N. J., has just been distributed among the trade and will be found of special value to architects, builders and house owners generally. This is the first of a series of Bulletins dealing with this type of elevator, and the company points out that it has made a special study of electric dumbwaiters having continually made improvements in its machines since they were first placed upon the market. Reference is made to the fact that the company has been engaged in the manufacture of elevators exclusively for thirty years, and that its machines are noted for their "sturdy and simple construction and efficient operation." Several types of machines are described as well as the special features of mechanism, the types of control, the cars and the guides and hatchway construction. A plan view is presented showing the usual arrangement of the hatch for an electric dumbwaiter, that is, wall climber construction. Those of our readers who are interested in electric dumbwaiters can obtain a copy of this bulletin, which is known as "Series No. 16," by addressing the company.

Mineralith—A Composition Flooring and Wainscoting

There are many readers of THE BUILDING AGE likely to be interested in an illustrated pamphlet devoted to an exposition of the merits of Mineralith, a fireproof composition flooring and wainscoting which is being distributed by the New York Mineral Flooring Company, Inc., 151 West Eighteenth Street, New York City. The point is made that this flooring is fire, water and germ proof, is easily kept clean and is especially adapted for all rooms where it is necessary to walk or stand. It has a non-slipping surface and the claim is made that it will not disintegrate, therefore will raise no dust. The base and floor may be laid in one continuous piece with round corners, and is said to be ready to walk upon in twenty-four hours. It is a non-conductor of sound, heat and cold and is inexpensive. It weighs only 3 lb. to the square foot, ½ in. thick and can be laid over any old floor in any building or on porches. It is laid in plastic form and in almost any color or combination of colors. It is adapted for use in all kinds of buildings and, in fact, wherever a durable sanitary fireproof floor is wanted. We understand that the company will send a sample of the flooring to any architect or builder who may make application for it.

Stanley's Wrought Steel Back Catch

Another addition to the line of garage hardware which is being introduced to the attention of architects and builders by the Stanley Works, New Britain, Conn., is the wrought steel back catch illustrated in Fig. 3. This catch is intended for garage and barn doors 1¾ in. thick and is of a nature to hold the door firmly when swung open against the side of the building. The construction is such that opening the door forces the stout hook over the catch plate, in which position it is securely held down by the double leaf steel spring. In order to unlock the hook it is only necessary to press lightly on the thumb piece. The handle is used as a "pull" to close the door. The escutcheon plate is struck-up to act as a bumper against the catch plate, thus taking from the hook the shock of the sudden stopping of the motion of the door. The company points out that by means of the slotted screw holes the catch plate may be adjusted to meet the bumper squarely. These catches are packed one set in a box with screws, and can be furnished in Stanley japan and sherardized finishes. The

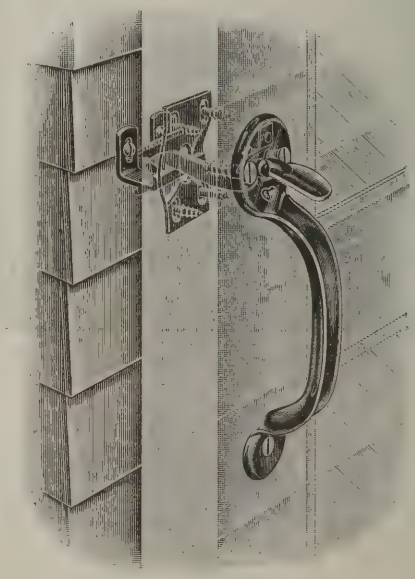


Fig. 3—Stanley's Wrought Steel Back Catch

(*Continued on page 22 of the advertising section*)

New Color Tones in Stucco

We have just completed the first of a series of experiments in coloring stucco by the use of colored aggregates, such as marble and granite screenings, colored sand, gravel, etc. The new effects secured are not uniform tones, but are variegated, giving life, character and warmth to the stucco.

We have prepared a booklet which reproduces specimen panels of these experiments in full scale and color. It contains complete notes and specifications and explains in detail this new development in home construction. Send the coupon below for a copy of this book—also for our free monthly Contractor's Atlas, containing information and helps for builders.

The Atlas Portland Cement Company

Members of the Portland Cement Association

New York Chicago Phila. Boston St. Louis Minneapolis Des Moines Dayton Savannah

Atlas-White Stucco Home
Minneapolis, Minn.
Chapman & Gage, Architects



ATLAS WHITE

The Atlas Portland Cement Company,
30 Broad Street, New York, or Corn Exchange Bank Building, Chicago
Send me information and specifications on the new color stucco—also the Contractor's Atlas and special information on the subjects checked:

☐ New Stucco Homes ☐ Remodeling in Stucco ☐ Stucco Garages ☐ Stucco Bungalows

NAME..... ADDRESS.....

The finishing touch

Floors that are easy to care for and which stay new looking, woodwork that remains unclouded, enamel that keeps its whiteness — these things give your customers a feeling of confidence and satisfaction. They judge your whole contract by the part they can see and test.

Murphy Varnish

"the varnish that lasts longest"

produces a finish that will do you credit in first appearance and in length of service. It goes farther and works easier than poor varnish. It saves labor.

You may think the public do not appreciate good varnish. They would if they knew all the facts. Through our advertising in the leading magazines, we hope to make them see that it is worth while to pay for a good varnish job. Have we your co-operation?

Our principal house-finishing products are:

Murphy Transparent Interior Varnish
Murphy Transparent Floor Varnish
Murphy Transparent Spar Varnish
Murphy Nogloss Interior Varnish
Murphy Semi-Gloss Interior Varnish
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

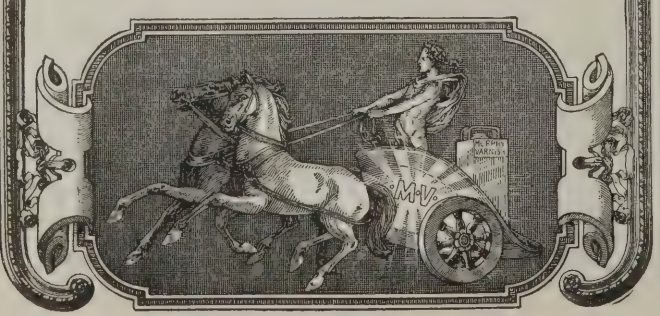
Write for further information.

Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate



(Contiued from page 226 of the editorial section)

extreme length of the handle is 7½ in. and the gross weight of each outfit is three-quarters of a pound.

Knickerbocker Portable Woodworker

One of the latest candidates for popular favor in the way of a portable woodworker is the machine illustrated in Fig. 4, and which has been placed on the market by the Knickerbocker Company, Jackson, Mich. This machine is said to be the result of thirty-three years' experience in the use of woodworking machinery, and as much more is said to depend upon the design and construction of the frame work than any other part of a portable woodworker, the company states that it began its improvements at this point. The frame is built of two castings forming the base and top, to which are bolted the four legs of 2 x 2 x ¼ in. angles. At the bottom of the legs are brackets to be used for fastening the machine to the floor. The machine is 37 in. in height and the weight is 770 lb. com-

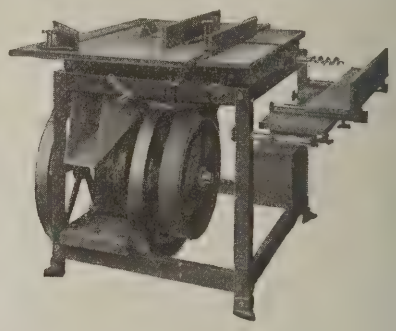


Fig. 4—The Knickerbocker Portable Woodworker

plete with engine and all attachments, or 440 lb. without power, equipped with countershaft and pulleys. The table top is 28 x 43 in., made of rock maple cut in narrow strips and glued together. It is also bound with iron to prevent warping and has beveled slides in which the guides work freely without any side motion. The raising and lowering of the table is accomplished by a horizontal crank handle at the operating end of the table, the latter remaining level at all times. The arbor is 30½ in. long, made of steel, finely machined and fitted for the necessary tools constituting the equipment. The jointer or planer will make a cut up to 6 in. width. It is attached to the upper foundation with a bearing on each side of the jointer head, the latter being pointed out by the company as an exclusive feature. The dado head or groover is 6 in. in diameter, of the Huther type, and will groove from 1/16 in. to 1½ in. widths. The boring attachment is fastened to the iron legs by means of two 1-in. studs with hand wheels and can be easily removed. The machine is also equipped with a 10-in. sander complete with guides, the arrangement being such as to require but little time in changing papers. The sawdust guard spouts sawdust away from the machine into any receptacle placed under the spout. The company furnishes an 8-in. emery wheel as well as a band saw attachment.

Motor Trucks of America

"Motor Trucks of America" is the title of an extremely comprehensive volume of 164 pages which contains a photograph and complete specifications of each of 118 makes of American motor trucks. Its broad scope and opportunities for comparison render it of value to the builder who now owns or is contemplating the purchase of a motor truck for his business. The present issue constitutes Vol. 5, and the scope of the

(Continued on page 24)



All Costs Guaranteed!

The Meaning of "PROVEN" Plans

In the building of an ordinary, inexpensive house, the low cost forbids that much time shall be put on the perfecting of the plan. In **Gordon-Van Tine Homes** the plans are perfected to the highest point—because **their cost may be spread over a hundred or more duplications of the same house.** This is an important point; for it assures **better built, better laid-out houses in spite of the lowered cost.**

You Can Figure Your Profits Definitely

GORDON-VAN TINE HOMES are **all** sold on a basis of **definite, fixed price with everything** supplied. We explain fully just **exactly** what we furnish. **No extras to buy**—no chance for misunderstanding. And whether you want to build the house shown or any of our **200 others,** you buy at **"Mill-direct-to-you" Prices. Plans free.** Material **all highest standard grades;** prices lowest. **Prompt shipment** to you **anywhere.**

Send for Our New Plan Book—Free!



Our new, free book, **"Gordon-Van Tine Homes,"** is the plan book pricing houses **both Ready-cut and not Ready-cut.** Lets you build **either** way. Shows **over 200 homes**—many **adapted from plans of America's best architects,** but for **inexpensive** building. All tested and **proven** by being **built hundreds of times**—everywhere. Some near you; **local references** on request. Remember, three banks and over **100,000 home-owners and 10,000 contractors** vouch for **our complete trustworthiness.** Use the coupon.

Gordon-Van Tine Co.
Satisfaction Guaranteed or Money Back
860 Federal Street, Davenport, Iowa
In Business Over Half a Century

Gordon-Van Tine Co.,
860 Federal Street, Davenport, Iowa.

Please send me FREE the books checked below:

- ☐ Gordon-Van Tine Home Plan Book
- ☐ Roofing Samples
- ☐ Summer Cottages
- ☐ Garages
- ☐ Wholesale Lumber Price List
- ☐ Barn and Out Building Plan Book
- ☐ Building Material Catalog
- ☐ Greenhouses and Hot Bed Sash

Name .....
Street No. ..... State .....
City .....



Why Every Modern Kitchen Should Have a KOHLER Sink

KOHLER Sinks have the same quality distinctions that make KOHLER Bath Tubs and Lavatories first choice for the well planned home.

The designs have the hygienic features that are characteristic of all

KOHLER WARE

always of one quality—the highest

KOHLER Sinks are made for right and left-hand corners, and for open wall spaces. They have right, left or double sloping drain-boards, and are made without aprons.

"It's in the Kohler Enamel"

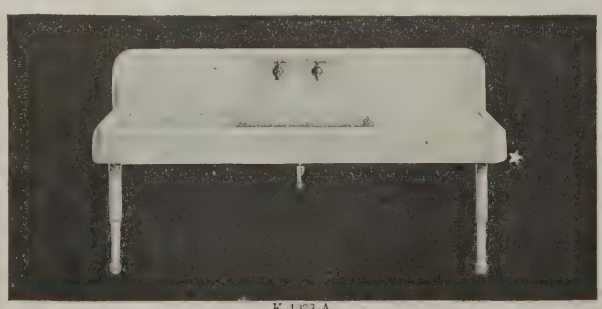
The whiteness of the enamel is notable in all KOHLER products, each of which has our permanent trade-mark—a guarantee of its high quality.

Owing to manufacturing economies the prices of KOHLER WARE are not excessive.

KOHLER CO., *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Atlanta Pittsburgh
Detroit Chicago Indianapolis St. Paul St. Louis
Houston San Francisco Los Angeles
Seattle London

★ The KOHLER permanent trade-mark in faint blue appears on end of sink shown by star.



K-1363-A

book has been increased so as to include the principal trucks using pneumatic tires—all previous editions having been limited to those using solid tires. One of the most popular features of previous editions has been the introductory article. This year the subject treated is "Lengthening the Life of the Motor Truck," and various manufacturers have contributed an abundance of valuable and reliable matter. An analysis is made of the various ordinary abuses to which a truck is subjected, and the reader is shown just how these abuses shorten the life of a truck. The demand for the articles which have appeared in the past has been so great that they have been reprinted in pamphlet form, and will be sent without cost to any of our readers requesting them on their business letterhead by the B. F. Goodrich Company, Akron, Ohio, which will also send the book gratis.

Exhibit of Standard Scale & Supply Co. at Chicago Cement Show

Among the many attractive exhibits at the Cement Show recently held in Chicago mention should be made of that of the Standard Scale & Supply Company, 1345 Wabash Avenue, that city, a view of which is presented in Fig. 5. The goods displayed included some new concrete mixers of the same simple and compact con-



Fig. 5—Exhibit of Standard Scale & Supply Co. at Cement Show

struction which has characterized these machines in the past. There is, however, a noticeable shortening of the frame in the latest models so as to provide for short turning, easier handling and greater portability of the mixers. The half-bag mixer has a frame only 6 ft. 3 in. long, and while weighing but 1500 lb. has a capacity of 50 to 60 yards of mixed concrete a day. Perhaps the most distinctive feature of the exhibit of the company was the low-charging feature. Careful measurements made of the five mixers exhibited showed the greatest height from the top of the charging chute to the platform on any size to be only 12 in. The charging shute is a broad flat-topped heavy casting with high, widely extending wing sides, thus permitting the nose of a wheelbarrow to be inserted over the chute and the barrow easily discharged by merely raising the handles and without spilling the materials. The barrows could be dumped either forward or sideways over the low wide charging chute, as might be desired. All of the new models have belt drives with floating idlers which lessen the shock in starting and prevents transmitting the jar of the mixer to the engine. The "SSS" mixers were also shown, these being the same in general design as "The Standard," but made with cheaper mountings to meet the requirements of those who demand a very low priced

(*Continued on page* 26)



Railroads find that CON-SER-TEX is the most satisfactory Roofing Material for Pullman Cars.

Can you conceive of any roof that has to withstand as much racking and straining as that of the Pullman Car? Under the most severe and extreme weather conditions—during the winter blizzards, the spring rain storms and the hot summer weather—the roof of a Pullman Car must be weather-proof.

CON-SER-TEX Canvas roofing gives better results than steel. Two of the largest roads have gone back to **CON-SER-TEX** after having tried steel roofing. It's on practically all Pullmans.

While **CON-SER-TEX** withstands the wear and tear of railroading, it gives even better satisfaction as a covering for porch floors, roofs, sleeping balconies, sun parlors, kitchen and laundry floors; in public buildings, hospitals, country clubs, etc.

CON-SER-TEX is a specially prepared, chemically treated cotton fabric which will not rot, stretch, shrink, peel or crack.

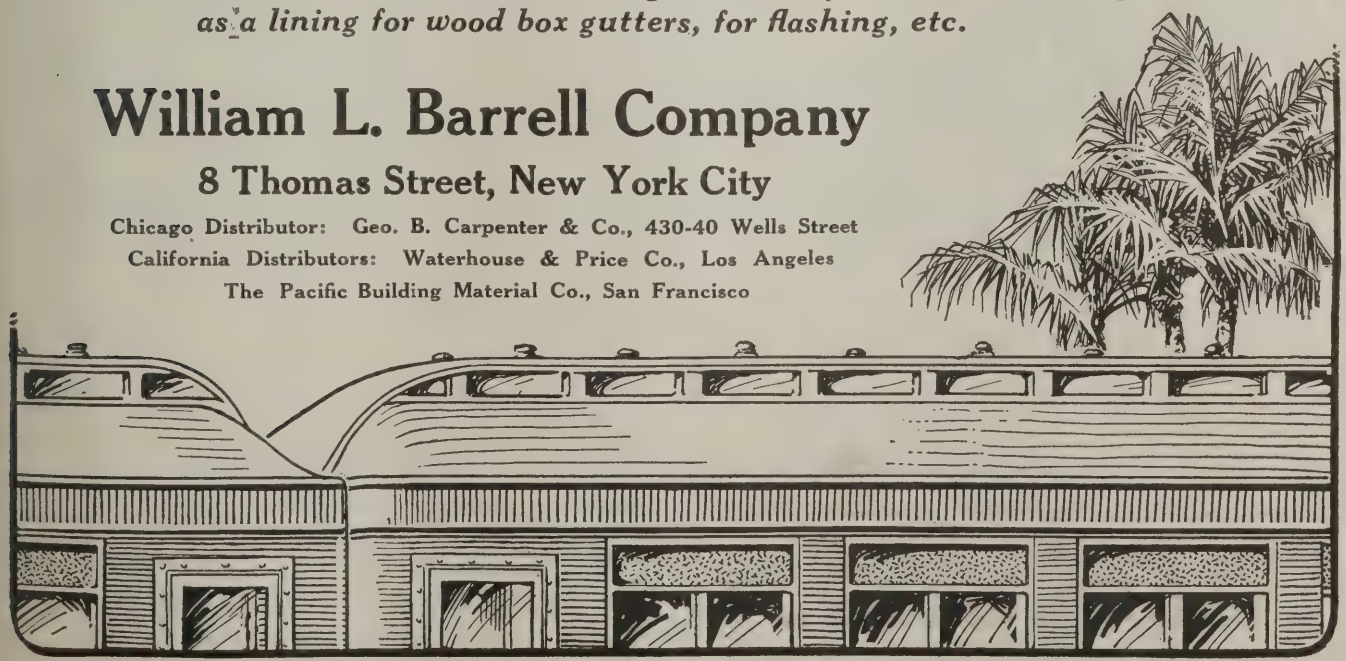
We will send you generous samples and prices upon request. You should have complete information on this satisfactory profitable roofing material.

Send for our illustrated booklet "ROOFING FACTS and FIGURES." It contains interesting data on CON-SER-TEX and its many uses as a roofing material, porch floor covering, as a lining for wood box gutters, for flashing, etc.

William L. Barrell Company

8 Thomas Street, New York City

Chicago Distributor: Geo. B. Carpenter & Co., 430-40 Wells Street
California Distributors: Waterhouse & Price Co., Los Angeles
The Pacific Building Material Co., San Francisco





Fiberlic Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.
Owned and Operated by Nicholson File Company

machine. Two styles of "The Standard" material hoists were also on exhibition. These are designed for small building construction, and are proving very popular with contractors. One style has a reversible single drum hoist mounted on skids with gasoline engine, and is designed to operate a two-platform material elevator. The other style was a single drum reversible hoist mounted with gasoline engine on a low four-wheel truck designed to be lowered into a basement or readily moved to any location where a hoist may be needed. Either of the machines may be used as a single line hoist, thus adapting it to a wide range of use in building operations.

Louisville Branch of Johns-Manville Company

Since the fifteenth of March the Louisville branch of the H. W. Johns-Manville Company has been located in the new building at the corner of Fourth Avenue and Guthery Street, Louisville, Ky. The new quarters are situated in the very center of the retail district of the city and provide a frontage on Guthery Street. The office is in charge of A. H. Voigt, who will have under him a staff of salesmen who in the new and commodious quarters will be able to give even bigger and better Johns-Manville service than heretofore to the buying public of Louisville and surrounding country.

Medusa White Portland Cement

Photographic reproductions of dwellings and other buildings in which Medusa White Portland Cement has been used are contained in a new catalog issued by the Sandusky Cement Company, 624 Engineers Building, Cleveland, Ohio, and entitled "Medusa White Portland Cement." Interesting information is presented concerning stucco and its various finishes. A table of colors gives the pounds of color required for each bag of cement in order to secure either light or medium shades. There is also given some information about concrete building blocks, ornamental work, etc.

Economy Chemical Closet

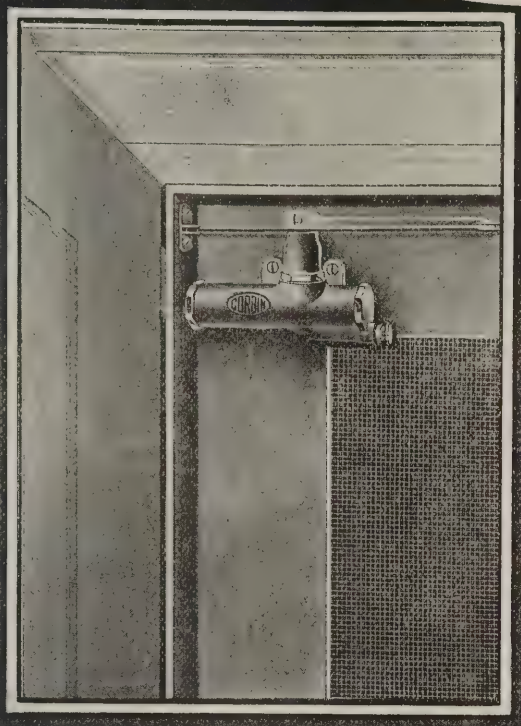
A chemical closet is one of the most necessary conveniences in rural communities when there is no public sewerage, as it replaces the so often condemned privy. One of the types of closet which has met with popular approval is the Economy Chemical Closet, manufactured by the Sanitary Chemical Closet Co., Hillsdale, Mich. It covers a floor space 14 x 21 in., and is 17 in. high, being made from rust-proof galvanized metal, enameled inside and out. At the back of the container is provided a place to keep the chemical and toilet paper. Each closet is guaranteed. A booklet illustrating and describing this convenience and entitled "Economy Chemical Closet," is being distributed by the company. Its advantages and construction are set forth, together with illustrated descriptions of various ways in which it may be installed, and also illustrations and price list of parts which unusual installations may require.

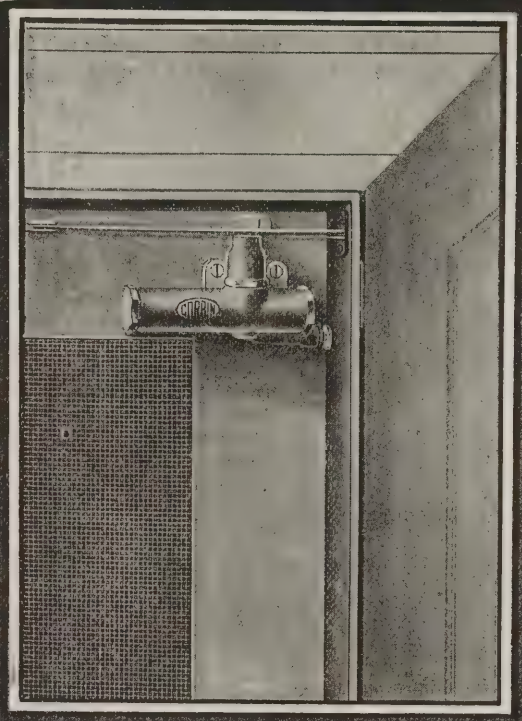
Consolidation of Sheet Metal Interests

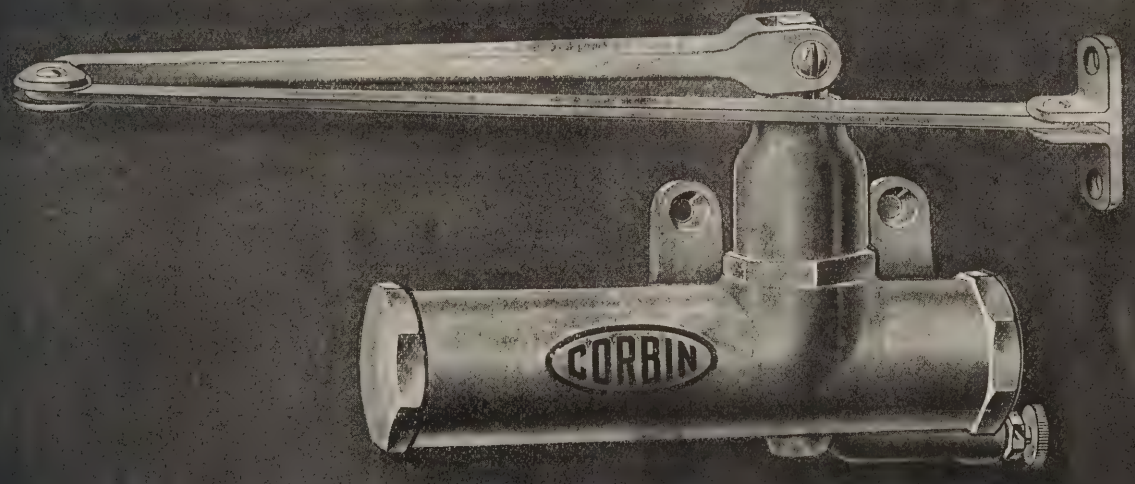
Official announcement has been made of the consolidation of the Wheeling Corrugating Company, Wheeling, W. Va., with the Whitaker-Glessner Company of that city, the latter for a number of years having owned all of the capital stock of the former company and has now assumed its liabilities and assets. Except as to the name, no change has been made and the business of the Wheeling Corrugating Company is

(*Continued on page* 28)

CORBIN







THE CORBIN SCREEN DOOR SILENCER

We believe this to be superior to any other Screen Door Check on the market. It has the same checking mechanism as the other Celebrated Corbin Checks, and is made with two sizes of springs for light and heavy doors. It is right or left hand without change, and works equally well in either direction. It requires only three inches of space between the screen door and entrance door, is easily applied, easily adjusted, and requires no attention. It can be sold at popular prices, and is certain to have a large sale.

Any Corbin dealer can give full information—or write us for particulars.

P. & F. CORBIN

The American Hardware Corporation, Successor

NEW BRITAIN, CONN.

NEW YORK CHICAGO PHILADELPHIA



now conducted by the present organization under the name of Whitaker-Glessner Company, Wheeling Corrugating Department. The branch offices and warehouses will be continued as at present.

Test of Composite Metal Lath Partition

Early in the present year a very interesting fire and water test of a composite metal lath partition was made at the Columbia Fire Testing Station under the supervision of Professor James S. Macgregor. At this test there were present representatives of the Bureaus of Buildings of Greater New York, also of the Board of Fire Underwriters and of the Composite Metal Lath Company, 128 Broadway, New York, maker of the metal lath in question. The lath sheets were 40 in. wide and were fastened to a ⅜-in. round rod top and bottom, the rod being held by the angle iron framework of the test structure, which was of the standard size required by the New York Bureau of Buildings' specifications as well as by the New York State Industrial Commission. The inside browning coat was a gypsum cow bay sand mix, and was applied December 28, 1916, and a hard finishing coat was applied December 30. The total thickness of the inside was 1 in. The plaster used for the outside browning coat was a gypsum cow bay sand mix approximately 1 in. thick, so that the total thickness of the partition was 2 in. The purpose of the test was to determine the effect of a continuous fire against the partition for one hour, bringing the temperature gradually up to 1700 deg. Fahr. in the first half hour and maintaining an average of 1700 deg. during the last half of the test. Then a 1⅛ in. stream of water at hydrant pressure was thrown against the partition for 2½ minutes. The results of the test showed the composite metal lath to have given very satisfactory results.

Annual Meeting of Detroit Steel Products Company

At the recent annual meeting of the Board of Directors of the Detroit Steel Products Company held at their offices, 2250 East Grand Boulevard, Detroit, Mich., reports from the executives showed 1916 to have been the most successful year in the history of the company, both from the standpoint of sales and products. Recent indications, it is stated, are that 1917 will show a proportionate gain over last year. The following officers were elected:

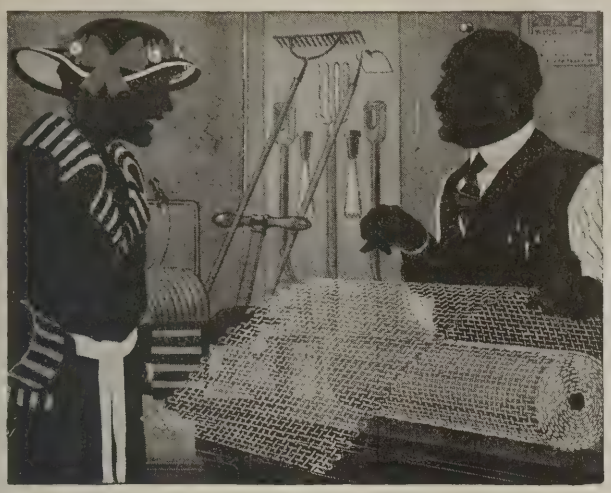
President ..... J. G. Rumney
Vice-President ..... R. S. Drummond
Secretary ..... H. F. Wardwell
Treasurer ..... E. R. Ailes

In order to provide for the increase in business which is evidently expected this year, the company has already trebled a portion of its equipment, adding several new buildings and making a rearrangement of most of its factory departments. It will be recalled that the company manufactures the Fenestra solid steel windows for factory buildings and also self-lubricating springs for motor cars and trucks.

U. S. Expansion Bolt Company Increases Its Facilities

In order to meet the rapidly growing demands of its business while depending upon outside interests for its source of supply, the U. S. Expansion Bolt Company, Duane and Elm Streets, New York City, has purchased the plant of the Columbia Malleable Iron & Steel Company, Columbia, Pa. By means of these increased facilities the company will be enabled to turn out not only better work but more of it. At the same time it will enable the management to make immediate deliveries from complete stock, which is something greatly to be desired and which cannot fail to be ap-

(*Continued on page* 30)



Quality Retailers Sell PEARL—the Quality Screen

YOU'LL find genuine G & B PEARL Wire Cloth on sale at the best retail stores in America. No other screen material made offers so many distinct advantages for door, window and porch screening as G & B PEARL Wire Cloth. That's why merchants whose policy is "quality first" sell and endorse it.

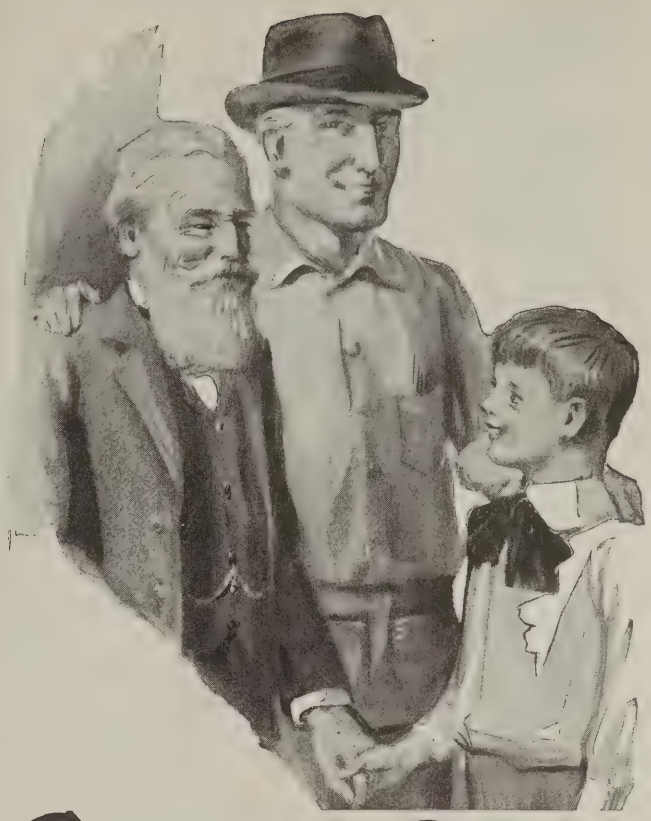
The first requirement of wire cloth is—durability. Rust, not wear, ruins screens. G & B PEARL resists rust and outwears painted and galvanized cloths so far that there is no ground for comparison. The process which makes PEARL so durable is a secret of the Gilbert & Bennett Mfg. Co., consequently no similar cloth *can* be "just the same" in wear or manufacture. Make sure you get the genuine by looking for the marks of identification. Two Copper Wires in the Selvage and a Round Tag on each roll of real G & B PEARL Wire Cloth. Insist on seeing them.

GILBERT & BENNETT Pearl WIRE CLOTH AS NEAR RUST PROOF AS METAL CAN BE MADE

There's a retailer near you who sells and recommends G & B PEARL for permanently screening doors, windows and porches. See him or write us direct for samples and literature. Address Dept. D.

The Gilbert & Bennett Mfg. Co.
New York Georgetown, Conn. Chicago Kansas City

Pearl is made in two weights — regular and extra heavy
The best Hardware Dealer in your city sells "PEARL"



Good for a generation

The first RU-BER-OID roof was laid nearly 25 years ago.

It was a novelty.

But it made good.

RU-BER-OID became the standard prepared roofing.

Time has proved it the best and least expensive of all roofings.

RU-BER-OID roofs laid more than 20 years ago are still giving good service. Many of them have not cost one penny for repairs.

You can distinguish ***genuine*** RU-BER-OID from imitations by the "Ru-ber-oid Man" on the wrapper.

Your dealer will show you RU-BER-OID in Slate Gray, Tile Red and Copper Green.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO
Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete
The Paraffine Paint Co., San Francisco (Under License)
The Standard Paint Co. of Canada, Ltd., Montreal



Pronounced "RU" as in RUBY
RU-BER-OID ROOFING
COSTS MORE - WEARS LONGER
MADE BY THE STANDARD PAINT COMPANY, NEW YORK, BOSTON, CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ruberoid


No. 7850

KOLESCH

"BUILDERS"

Tilting Level

Is designed particularly for the leveling and plumbing of walls, giving lines and levels for buildings, laying out angles, grading streets, sewers, drains, etc.

Sturdily built for durability, yet sensitively accurate.

Sold complete in a polished box with plumb bob, adjusting pins, metal trivet, book of instructions, and tripod for $57.50

KOLESCH & COMPANY

138 Fulton Street New York, N. Y.

"YANKEE"

Plain Screw Drivers

STANDARD No. 90

CABINET No. 95

They cannot loosen in the handle, in use or abuse.

You have our Guarantee.



They are durable as the high grade steel that composes them, and will render faithful service for generations. The comfortable handle and various lengths of blade make them suitable for all classes of work.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.

Lehigh Ave., Philadelphia, Pa.

preciated by customers everywhere. The company has just brought out a new 1917 catalog which covers its very comprehensive line, and at the same time shows a number of new styles which have been brought out with a view to rendering more efficient service to certain specialized branches of the building trade.

Corbin's New Screen Door Check

The season is rapidly approaching when screen doors will be in extensive use, and as an important adjunct of the hardware equipment of such a door, P. & F. Corbin, New Britain, Conn., are directing attention to the new check which they have placed on the market. This addition to their line of overhead checks, it is stated, has the same rack and pinion movement as their larger checks, the same valve construction, the same provision to prevent leaking, the same simple adjustment, the same liquid and the same adaptability to right and left-hand doors without change. It lies close to the screen door, a space 3 in. in depth, it is said, being sufficient for its accommodation. It can be attached to a screen

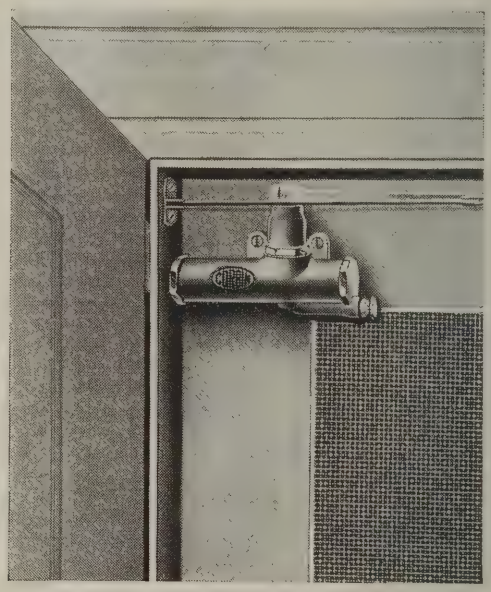


Fig. 6—Corbin's New Screen Door Check

door with a top rail as narrow as 3½ in. A general view of the check as it appears when applied to a screen door is presented in Fig. 6 of the engravings. The check is made in two numbers—No. 01 and No. 02—the difference being in the strength of the spring, which is varied for light and heavy screen doors. The finish is Columbian bronzed, the same as the other Corbin checks.

Ru-ber-oid Roofing

A series of exceedingly attractive booklets printed in colors and each devoted to a specific subject constitute a portion of the literature involved in the advertising campaign conducted by the Standard Paint Company, 588 Woolworth Building, New York City. Each of these booklets carries an attractive cover design in colors, while the matter presented is of a nature to strongly appeal to the trades addressed. One of the booklets contains hints on Building a Barn and the merits of using Ru-ber-oid as a roofing material; another has to do with Building a Bungalow, the subject being treated along similar lines; a third gives information about "Building Your Own Garage," with designs, plans, etc., together with brief descriptive data in which the use of Ru-ber-oid roofing is strongly recom-

(*Continued on page* 32)

The Roof You Put On



—can make or ruin your standing with your clients. A shoddy, leaky roof is one of the greatest causes of dissatisfaction. Don't take chances with inferior roofing materials. Use

Bayonne Roof and Deck Cloth

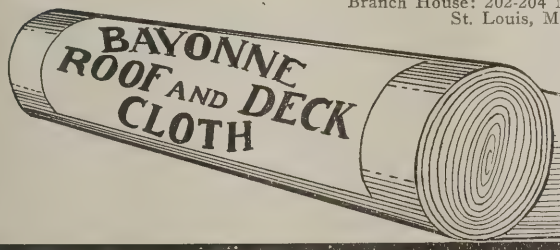
Bayonne makes the roof absolutely water-tight. Laid on dry boards. Can't crack or peel as ordinary roofing canvas does. No buckling as with metal. Bayonne is made by a special process that resists the weather. It is the best you can buy—and the most economical. It's honest value.

Sample Book D gives prices and laying instructions. Write for it.

John Boyle & Co., Inc.

112-114 Duane St. — 70-72 Reade St., New York City

Branch House: 202-204 Market Street, St. Louis, Mo.



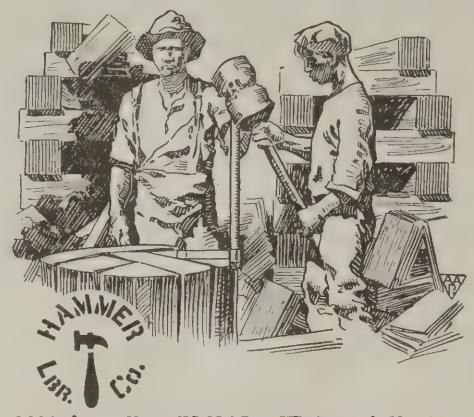


That Carborundum Niagara Grinder Puts New Life Into Any Edge Tools—

MY plane bit for instance was way off—needed grinding. On one corner of my work bench is the ever handy Carborundum Niagara Grinder. A few turns and the bit is sharp—you never saw a wheel that cuts so clean and quick as that Carborundum Wheel. Every Niagara Grinder has one. ¶ Then a couple of rubs on a Carborundum sharpening stone and my plane bit has a keen, smooth edge that will stand up on the job. ¶ That Carborundum Niagara Grinder is a dandy tool. Easy and smooth running—well made—durable—every one of you fellows should have one.

Ask your hardware dealer. Send for the Carborundum catalog.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.



HAMMER BRAND
Hand-Made Heart Cypress
SHINGLES
The Shingles of our Grandfathers
Write for Booklet
The Hammer Lumber Co.
LIBERTY BUILDING. PHILADELPHIA
Member Philadelphia Wholesale Lumber Dealers' Association



3
Efficiency Developers
for builders and contractors. While low in price, they are high in quality, and backed by the guarantee of
DIETZGEN
the firm with the reputation for dependable products.
Our *Catalog "B"* lists many other items of interest.
Send for it TODAY
Eugene Dietzgen Co.
Manufacturers
Chicago New York
San Francisco New Orleans
Pittsburgh Philadelphia





mended. Roofing a Home and Building a Poultry House are the subjects of other booklets. We understand that copies of any of these booklets will be sent to any reader of THE BUILDING AGE who may be sufficiently interested to make application to the company.

High-Class Concrete Specialties

Art Stone Company, makers of high-class concrete specialties, Waynesboro, Pa., has issued some interesting literature calling attention to the work which it is prepared to execute. The proprietor has devoted many years to procuring artistic effects from various classes of concrete work and is said to be able to imitate marbles, granite, sandstone, onyx and other natural stone. He obtains his results by different formulas with colored aggregates such as granulated granites, marble, limestone, sand, gravel and sundry special mixtures. Included in his work are many interior decorative features such as fireproof trim, mantels, fireplaces, tiling, etc.

Sargent's New Plane Knob

Repeated requests have been received by tool dealers for an extra heavy bench plane to be used by carpenters who work steadily on hard wood, where additional weight is of great advantage, as it means less of an effort to push the plane and less tendency for the plane to jump. Sargent & Company, 53 Water Street, New Haven, Conn., have provided for this demand by putting on the market a Japanned Cast Iron Plane Knob, shown in Fig. 7 and known as No. 60. This knob can be placed on the plane by removing the regular plane knob and knob nut. When used with a plane it has the advantage of placing the weight at the forward end in front of the cutter, where it will do the most good. The height being 2¾ in., there is plenty of room for the full hand of the user. This knob is intended for use only on Sargent bench planes of the following numbers: 10, 10 C, 14, 14 C, 15, 15 C, 18, 18 C, 22, 22 C, 24, 24C, 410, 410 C, 414, 414 C, 415, 415 C, 418, 418 C, 422, 422 C, 424, 424 C, 714, 714 C.



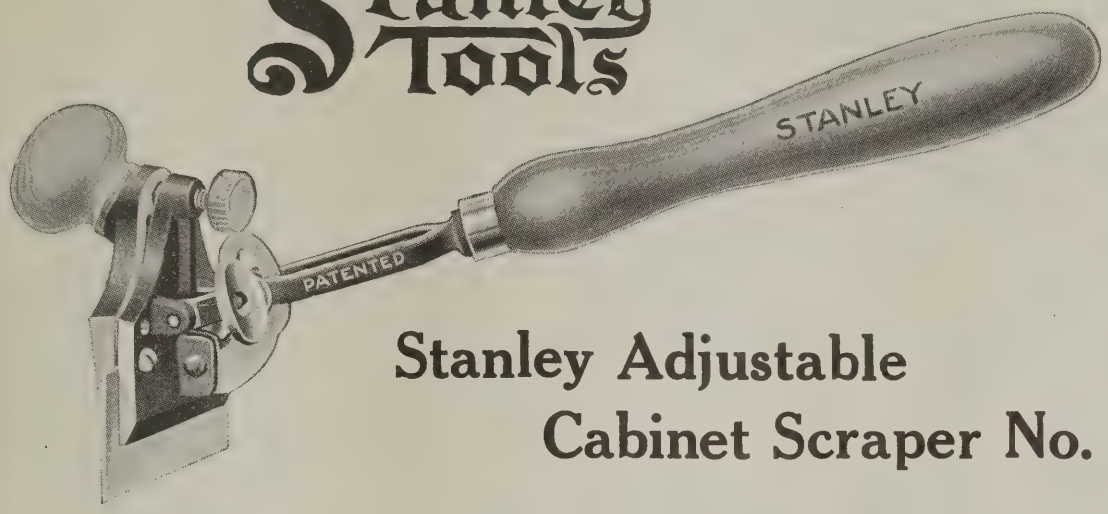
Fig. 7—Sargent's New Plane Knob

Constructing a Thatched Shingle Roof

The growing popularity of the thatched shingle roof has caused many questions to be raised by builders in many sections of the country as to the proper construction of this very attractive form of roof, and with a view to furnishing the necessary practical information a booklet entitled "Instructions for Designing and Constructing a Thatch Roof with Creo-Dipt Stained Shingles" has been compiled by the Creo-Dipt Company, Inc., 1030 Oliver Street, North Tonawanda, N. Y. This is a valuable contribution to the subject and goes into the matter thoroughly. A detailed explanation is given of how the rafters are furred and how the shingles are laid around eaves, ridges, dormers, etc. Full-page photographic views showing actual construction methods cover the essential points with which the builder should familiarize himself. Each view is accompanied by a short caption pointing out the more important features. In addition, a large size folded sheet contains scale drawings of an elevation of the roof showing the method of laying the shingles, a transverse section, longitudinal section, etc. The company maintains a service department, which is prepared to co-operate with contractors, architects and home builders, there being no charge for this service. A handsome *brochure* entitled "Thatch Roofs," and containing numerous photographic reproductions of houses in connection with

(*Continued on page* 34)

Stanley Tools



Stanley Adjustable Cabinet Scraper No. 82

Its form is such as to give a natural and easy position to the hands and it balances well in working. The handle is adjustable and can be tilted to give the blade any angle desired.

Special blades of different forms and widths can be securely held at any position required, thus permitting the tool to be worked in many places inaccessible to other scrapers.

14½ in. long, 3 in. blade, weight 1¾ lbs.

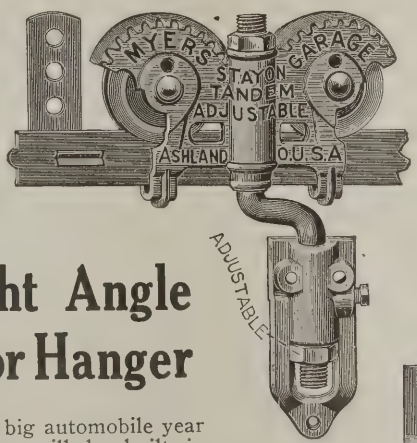
Manufactured by

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

IT SLIDES AROUND THE CORNER

AND WILL NOT THROW OFF THE TRACK

A GENERAL PURPOSE DOOR HANGER —ADJUSTABLE UP OR DOWN AND TO OR FROM THE BUILDING



Myers Right Angle Garage Door Hanger

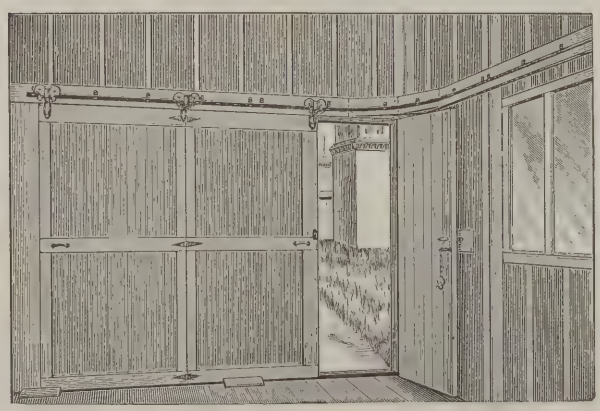
This is going to be a big automobile year and numberless garages will be built in your city.

The cumbersome, hard-to-move garage door is a thing of the past. What your customer wants is a door that will slide easily, like the Myers, around the corner and lie close against the inside wall out of the way when open.

The Myers Hanger is much more satisfactory than the old style of hinged, swinging door which is difficult to handle, especially when the wind is blowing. Its operation is not affected by the freezing and thawing of the ground, as the entire outfit is within the building.

Myers Door Hangers comprise a line of Plain and Adjustable Stayon Hangers with plain or covered track for use on barns, garages and any building where sliding door service is desired. Circulars of the complete line of Myers Door Hangers will be sent upon request.

Write our Service Department for full particulars and prices.



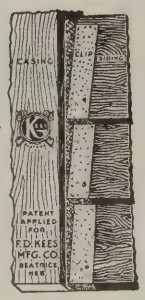
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KEES Metal Building Corners

One contractor saved $40 in labor on one job by using $14 worth of Kees Building Corners. They save the slow, expensive work of beveling, yet form a perfect *weatherproof* corner with popular mitre effect. Hold paint like wood.

For outside and inside angles—plain and fancy patterns. Sizes for all widths lap siding up to 12 in. Corners for drop siding also. Send for free samples and delivered prices.



Three siding clips applied.

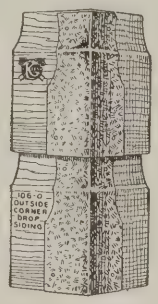
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Make a weather tight joint around door and window casing that is not affected by swelling or shrinking of the lumber.

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Metal Corners for Lap Siding



Metal corners for drop siding.



Metal corners for lap siding.

F. D. KEES MFG. CO., Beatrice, Neb. Box 812

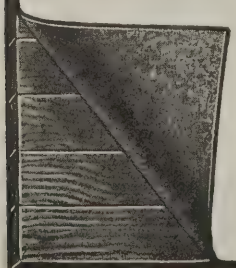
Compo-Board

Saves 15 to 30 Days' Time in Building

THINK what it means to you to be able to go right ahead with your interior finish without having to wait for plaster to dry. But that's not all—there's no running back to refit windows and doors, as the house is free from moisture. And when the last nail is driven, the house is ready for occupancy, free of all odors or dampness caused by new plaster.

But the saving in first cost of building is not the only thing in favor of Compo-Board. First cost is last cost. It cannot fall off, crack or dent and if the wall happens to get bumped with the corner of a table, chair or door knob, when the door is thrown open suddenly, there will be no hole.

The wood core of the genuine Compo-Board is what gives it such great strength, durability, moisture-proof, non-warping and non-shrinking qualities. No other wall board is made with the wood core, so be sure you get Compo-Board when you ask for it.



Sold by dealers in strips four feet wide by one to 18 feet long. Write for sample and interesting booklet.

The Compo-Board Co.
5778 Lyndale Ave. N.,
Minneapolis, Minn.

which the thatched roof has been used, is also being distributed by the company, and a more extended review of which may appear later.

Thirty Years with Berger Manufacturing Company

On the 5th of March of the present year, Julius H. Schlafly, general superintendent, completed thirty years of service for the Berger Manufacturing Company, Canton, Ohio. At that time the factory of the company was located on Rex Street, in a building 16 x 28 ft., giving 896 sq. ft. of floor space. To-day the plant covers nearly 27 acres. Mr. Schlafly states that thirty years ago he and Ed. Langenbach—now the president, but at that time the shipping clerk of the company—delivered the entire daily output of the concern to the freight depot in a hand cart. In those days the product consisted solely of eave trough hangers, eave trough and conductor pipe. To-day, the company is said to be shipping anywhere from twenty-five to thirty-five carloads every twenty-four hours of building specialties and steel office and factory equipment. On March 5, the date of the anniversary, many of Mr. Schlafly's business and personal friends took occasion to remember him in different ways and, as he expressed it, "My little celebration may not be of so much importance as that other celebration taking place in Washington to-day, yet it means more to me, and with all the encouragement and good words that I have received from my friends I feel that my entrance on my second thirty years is indeed propitious."

Stowell's Asphalt Roofings

The Stowell Manufacturing Company, 240 to 280 Culver Avenue, Jersey City, N. J., has recently issued from the press a neat four-page folder calling attention to the various asphalt roofings which it is prepared to supply. Special reference is made to the Star brand roofing, which it is claimed may be used on any kind of roof or may be used as siding for buildings; the Eureka rubber roof; the red and green slate surface roofing and the sandcoat. Reference is also made to Stowell's asphalt waterproof felts, which are made in weights to meet every purpose from 7 lb. to 40 lb. to the 100 sq. ft. It is interesting to note in connection with the equipment of the company's plant that it is having built by the Guyton & Cumfer Mfg. Company, Chicago, Ill., a complete new roofing machine which is said to be the latest type of this nature. The roofing will be made complete at one operation from dry felt to finished rolled goods or asphalt shingles, both strip and individual.

Catalogs of Ideal Concrete Machinery Company

We have received from the Ideal Concrete Machinery Company, 1310 Monmouth Avenue, Cincinnati, Ohio, copies of catalogs Nos. 28, 29, 30 and 31, dealing with special lines and products turned out by this enterprising concern. These catalogs contain the company's latest information in the way of concrete brick machinery, ornamental and special molds, Tycrete compound and colors, etc., etc. In one of the catalogs a valuable feature is the space devoted to the presentation of data for making concrete blocks, and including the materials, their proportions, and the method of mixing them for the securing of good results; a table of quantities of materials required for different sizes of Ideal concrete blocks; a table giving the weight and displacement of the various styles of blocks, etc. A working drawing of a silo and a table giving the sizes of silos adapted to various sized herds of cattle for a given length of time is another important feature. Machinery for the making of concrete bricks, sill and cap plates, etc., is illustrated; and data concerning automatic tampers, conveyor and

(*Continued on page* 36)

Pullmanize Your Windows

Approved by the Underwriters



The Underwriters Laboratories, under the direction of the National Board of Fire Underwriters, have made exhaustive fire and physical tests of

Pullman Unit Balances

and have issued a report of unqualified approval. There are today over

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The Secret of his success-

He Gets the Cream of the Jobs





"That's Jones the builder. He's making money. Shrewd business man! While other builders are competing against each other for every little job, the best jobs simply come to Jones because he has used Black Rock Wallboard in most of his work.

"His customers know how good Black Rock is, and recommend Jones. Jones says he uses Black Rock because he is building his business for the future. But the fact is, thanks to Black Rock, he is getting the cream of the jobs right now."



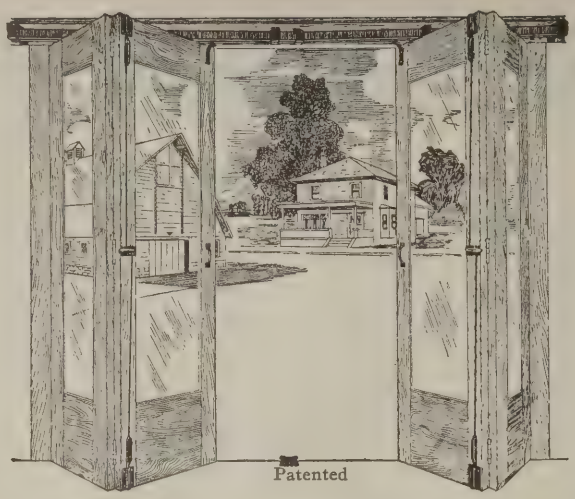
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1525 Ontario Place **Black Rock, N. Y.**

Black Rock Wallboard Co.
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Please send me stock sample of Black Rock Wallboard and booklet showing Black Rock jobs.

Signed .....
(Your name)

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(Your address)



An Ornamental Utility
For Private and Public Garages

R-W No. 435
Sliding Door Equipment

Keeps out meddlers, weather tight, folds back inside garage out of the way. Can't sag. Accommodates 3, 4, 5 or 6 doors to suit requirements.

For Public garages, equipped with electric opener and closer manipulated by push buttons from any place in garage.

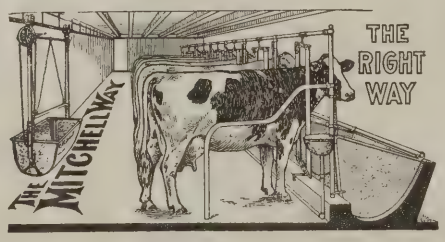
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SAN FRANCISCO LOS ANGELES NEW YORK CHICAGO

AURORA, ILLINOIS, U.S.A.

PHILADELPHIA MINNEAPOLIS BOSTON ST. LOUIS

Richards-Wilcox Canadian Co., Ltd., London, Ont.



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Adjustable to fit Cow or Calf

STEEL STALLS
with Stationary or Folding Sure-Stops

CARRIERS
for Milk, Feed or Manure

26 STYLES
Send for Complete Catalogue

MITCHELL MFG. CO.
39th and Forest Home
MILWAUKEE, WISCONSIN

feeder, the Blystone Block Plant Mixer, especially adapted to the mixing of concrete blocks, is presented. It also shows a complete line of the Ideal Concrete Machinery Company for 1917. The company states that it has been its purpose to turn out a catalog which would not only illustrate all the necessary machinery for the manufacturing of a high grade product, but which would also supply the concrete products man with information which would enable him to turn out a product of high quality.

Keystone Quality "Kreations"

The Keystone Varnish Company, 2016 Keystone Building, Brooklyn, N. Y., is sending out some very interesting literature relating to the 114 "Keystone Kuality Kreations" which it is prepared to supply on application. The information relates to paints for all purposes, both inside and out, also to enamels and varnishes for floors, woodwork, etc. The company makes announcement that it will be glad to send samples to architects and builders making application for them.

TRADE NOTES

Among the special features of the Hercules portable woodworker which has recently been placed upon the market is the arrangement by which it can be operated right handed—something, it is claimed, that has never before been accomplished on a portable woodworker. Another feature is found in the labor-saving advantages of four separate and distinct machines combined, each retaining its individual value. The machine is being distributed by the Machinery Merchants, Inc., 30 Church Street, New York City, and any interested reader can obtain from them circulars relating to this new machine.

In view of the inquiry which appeared in the correspondence columns of the paper a short time ago regarding the method of making magnesite floors, the announcement presented in another part of this issue by R. D. Adams, Humboldt Bank Building, San Francisco, Cal., is likely to prove of more than passing interest. He calls the attention of flooring, stucco and cement manufacturers to the use of magnesite, and asks if that which they are obtaining meets specifications in all respects.

An interesting article on "The Use of Thinners" is contained in the February issue of *The Carter Times*, the house organ of the Carter White Lead Co., Chicago, Ill., and, in view of the almost complete change within the last few years in the character of the lumber being used this information is likely to prove valuable. Another interesting article is "The Brushing of Wall Paint," in which some practical information is given. With this issue *The Carter Times* starts on its thirteenth year.

The Universal Portland Cement Co. announces the succession of R. L. Slocum to the position of assistant superintendent of Mill No. 5 at Universal, Pa., made vacant by the death of R. F. Knoth in January of this year. Mr. Slocum was born at Homestead, Pa., graduated from the Pennsylvania State College in 1905, spent two years in construction for the Homestead Steel Works and began work in the spring of 1907 for the Universal Portland Cement Co. in charge of building construction and installation of machinery at Universal, Pa. Since the completion of the plant he has been responsible for extensions, repairs and in part for operation. His title is the same as that held since 1911, but he is now in charge of plant operation and management under E. D. Barry, superintendent.

R. R.

Containing Plans of This House: Also a Colored Supplement and Plans

BUILDING AGE



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Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

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Saw Mill and Flooring Factory, New Albany, Ind.
Sales Office and Parquetry Factory, Rochester, N. Y.



Raise the Worth of Your Work

Make the buildings that you build *last*. Make them better looking. Make them waterproof. And do it with Bay State Coating.

Bay State Brick and Cement Coating fulfills its name worthily. Just a coat or two completely covers, protects and beautifies *any* brick, cement or stucco wall.

Bay State Coating comes in white and a variety of tints. Puts a good complexion on old or new walls, and keeps it there.

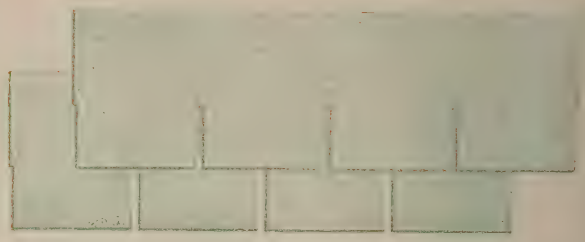
Bay State Brick & Cement Coating

We will be pleased to send you our booklet No. 19, which tells of thousands of buildings all over the country coated and protected with "Bay State." A sample of any tint you desire will also be sent along.

WADSWORTH, HOWLAND & CO., Inc.
Paint and Varnish Makers
Boston, Mass. New York Office: Architects' Bldg.

Bay State Cement Crack-Filler is the first-aid treatment to walls that crack. It is easily applied and not detectable.

Bay State Agatex makes cement floors dustproof, waterproof, oilproof and every-other-kind-of-proof. Our booklet A19 will tell you more about it.



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Mottled Asphalt Shingles

JUST the same kind of asphalt shingles you have been buying, but more attractive.

—Architects welcome them because they overcome the objections to the "flat" appearance that plain colors inevitably have. Home builders and owners will use more of them than they ever did of plain color asphalt shingles.

—They look surprisingly like slate—and one of the principal qualities of slate is beauty. Yet they cost the same as the plain color asphalt shingle, for they are made of identically the same materials. The beautiful mottled effects are gained by using varying proportions of the red and green slate as a surface, instead of only one color.

—Made in two styles only—Rex Strip Shingles and Rex Wide Space Shingles. Ask us about them. We will gladly send literature, photos reproduced in color and prices—also our 112-page Catalog which describes twenty-three Rex Products. All will be sent free to you—no obligation whatever.

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98 Pearl Street, Boston, Mass.

NEW YORK 1104 Equitable Bldg. CHICAGO 651 Peoples Gas Bldg. NEW ORLEANS 701 Hennen Bldg.



The Building Age

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Ives Patent Window Stop Adjuster

Prevents Drafts, Dust and Window Rattling



The only stop adjuster made from one piece of metal with solid ribs and heavy bed that will not cup or turn in tightening the screw.

Descriptive circular mailed on application

THE H. B. IVES CO., New Haven, Conn., U. S. A.

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Made of extra quality stock, carefully inspected and guaranteed free from the imperfections of braid and finish which destroy common cords so quickly.



The spots on the Cord, in any color, are our trade mark, used only with this extra quality.

Samples and full information gladly sent.

Samson Cordage Works

Boston, Mass.



Stained with Cabot's Stucco Stains
H. A. Perkins, Architect, Boston

Dingy Stucco Houses
Made Fresh, Bright and Cheerful

If you want to brighten up stucco houses that have become dingy and dirty from smoke and dust, and make them look like clean and cheerful places to live in, you can do it at small cost with

Cabot's Stucco Stains

(Waterproof)

A stucco house brightened up with these stains looks 100 per cent better, and the stucco is protected from dampness, freezing and crumbling, because the Stains are rainproof. They cost far less than the heavy paints or coatings, and they can be applied twice as quickly and easily. They don't cover the stucco with a painty coating, but preserve the natural texture in nice, soft tints that are artistic and pleasing.

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The most ordinary looking house can be improved in appearance by the use of IN-LADE DESIGN ROOFING. It may be laid over wood shingles—adding warmth, beauty and distinction to any home. No trouble, no painting, just unroll and apply. Made in rolls of red, moss green, and white. Approved by the National Board of Underwriters "Class C."

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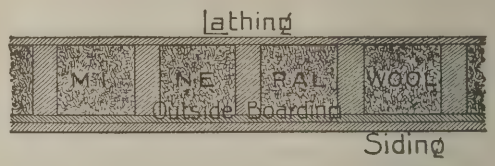
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Section of Outside Wall of House, Showing Wool Between Studding.

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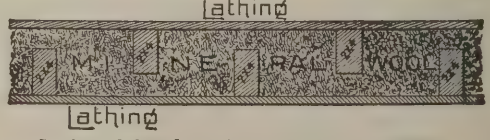
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BUILDING AGE

NEW YORK, MAY, 1917



THE HOME OF M. LAWRENCE AT PELHAMWOOD, N. Y.—ARCHITECT, W. S. MOORE, NEW YORK CITY

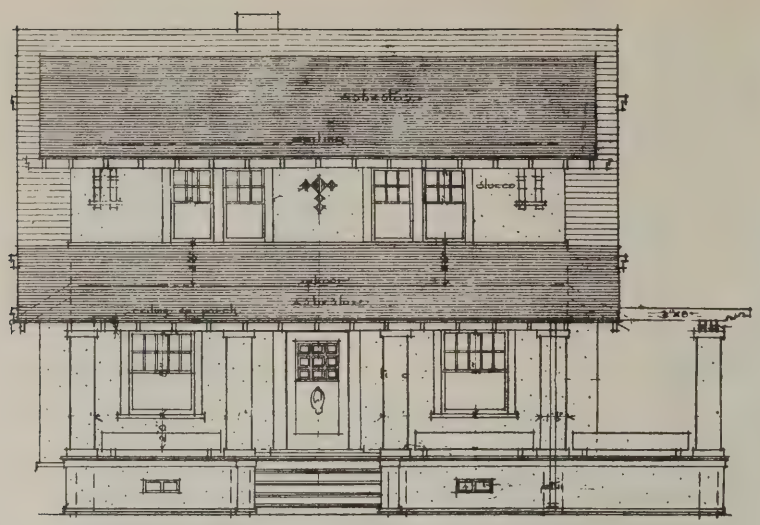
A STUCCO-COATED SUBURBAN RESIDENCE

A WELL CONSIDERED DESIGN WITH ROOF TREATMENT A FEATURE—DETAILS OF CONSTRUCTION

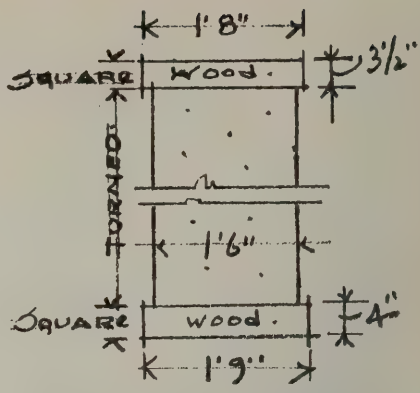
THE modern home which we have chosen as the basis of the present article embodies in its design and plan many popular features of present-day suburban architecture aside from its exterior covering of stucco. The long, sloping lines of the roof, both front and rear, the pergola at the side, the various details of the several dormers, the broad veranda extending across the front of the house, the placing of windows so as to balance the design and yet permit of plenty of interior wall space for the convenient placing of furniture—these constitute some of the features which are likely to receive more than passing attention on the part of the interested building contractor and prospective house owner.

The plan—popularly convenient and sufficient, yet highly economical—presents features worthy of mention. Entrance from the broad veranda leads directly into the living room, thus gaining the space often devoted to a vestibule, this, in the opinion of many, more than compensating for the added warmth which a vestibule is supposed to afford. The living room is about 16 x 19 ft. in dimensions and gives an appearance of additional spaciousness by reason of the buttressed openings between dining and living rooms and between "Den" and living room as shown in the pictures and details.

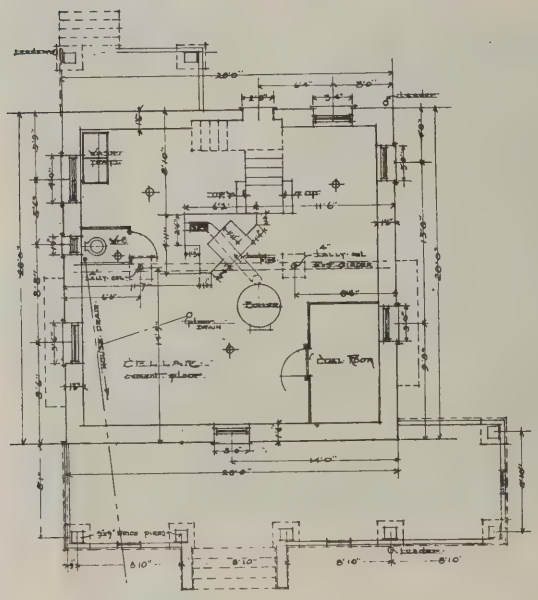
The stairs rise three steps from the "Den," as shown on the plan, to a broad landing, which is also reached from the kitchen and separated from it by a door, thus making a combination flight leading to the second floor, which it reaches in nearly the



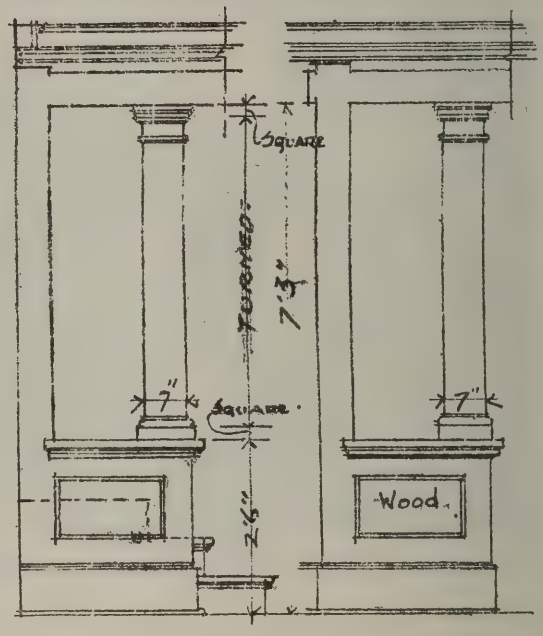
Front Elevation—Scale 3/32 In. to the Foot



Details of Porch Columns—Scale ½ In. to the Foot



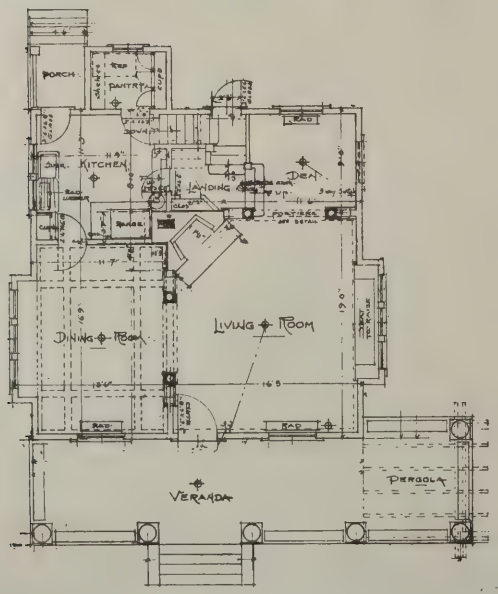
Foundation—Scale 1/16 In. to the Foot



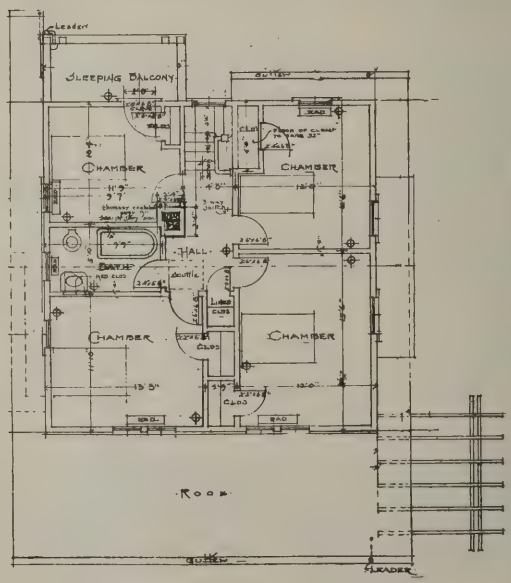
Partial Elevation of Opening Between Living Room and "Den"

Partial Elevation of Opening Between Living Room and Dining Room

Scale ⅜ In. to the Foot



Main Floor—Scale 1/16 In. to the Foot



Second Floor—Scale 1/16 In. to the Foot

center of the house. Under the main flight are the stairs leading to the cellar, thus economizing in space—an important factor in all house designing. Other features of the first floor are the bay window and beamed ceiling in the dining room, and the open fireplace in the living room, so placed that its chimney also serves the kitchen range as well as the furnace in the basement, thus resulting in chimney economy.

The layout of the second story is such as to permit of plumbing economy by reason of the position of the bathroom in its relation to the kitchen plumbing. Ample closet room is provided in each of the four chambers. The sleeping balcony at the rear constitutes an especially popular feature.



DINING ROOM END OF RESIDENCE OF MRS. M. LAWRENCE AT PELHAMWOOD, NEW YORK, SHOWING THE ARCHITECTURAL TREATMENT OF THE ROOF

In presenting the plans, elevations and constructive details of this house we have departed from our usual method and reproduced them directly from the designer's original drawings, thus retaining the individuality of the architect's conception in connection therewith.

The footings are composed of large, flat stones, which extend 4 in. beyond each side of the foundation walls. Large stones are also placed under the porch piers to serve as footings.

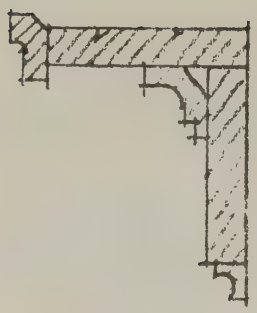
The foundation walls are composed of local stone laid up in lime and cement mortar. Below grade, the outside walls were well pointed and then given a heavy, smooth coat of cement, over which was applied a thick coat of tar to serve as waterproofing. Selected field stone was used above grade, the joints being raked out and pointed with tinted cement mortar.

The cellar floor is composed of concrete of a 1:2:4 mix laid to a thickness of 4 in., and receiving a 1-in. top dressing of cement.

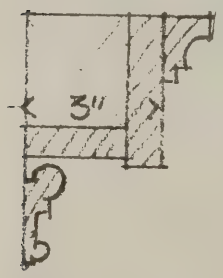
The chimney is of hard burned common red brick, the top being finished off with a cement cap. The three flues are lined with terra cotta, there being two 9 x 9-in. ones, used respectively for the boiler and the kitchen range, and a 9 x 13-in. one for the fireplace.

The framing timbers are of spruce, the sills being 4 x 6 in.; the girder in the basement is 6 x 8 in., supported on two 4-in. Lally columns resting upon stone footings; first story joists, 2 x 10 in., spiked to the sill, second story joists, 2 x 8 in., spiked to the studs and the second-story ceiling joists, 2 x 6 in., all spaced 16 in. on centers. The floor joists are doubled under partitions running the same way. The studs are 2 x 4 in., placed 16 in. on centers, the floor bridging being 1 x 3 in. The rafters and the porch floor joists are 2 x 6 in., all placed 24 in. on centers.

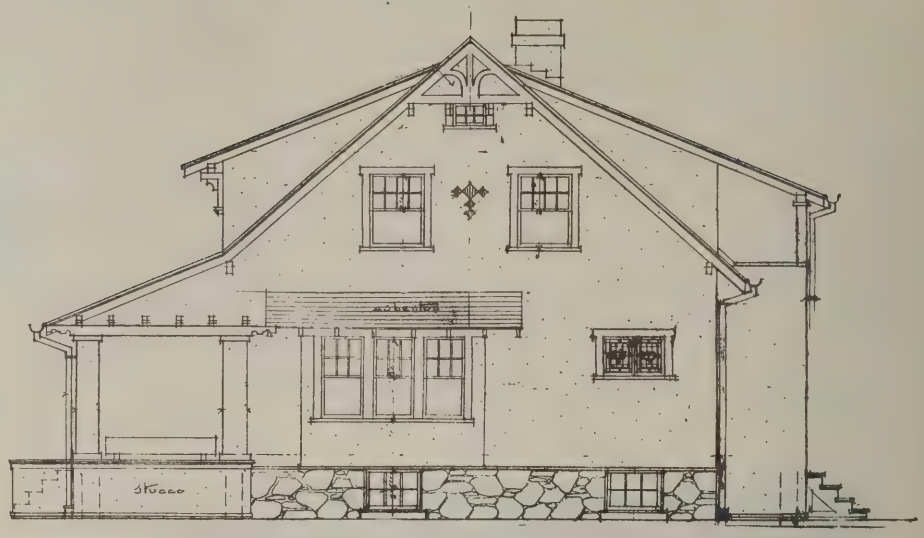
The main and dormer roofs are covered with ⅞ x 9-in. tongued and grooved yellow pine sheathing boards, upon which was placed heavy tarred roofing felt, well lapped and nailed. Over this were laid asbestos shingles fastened with copper nails. The roof of the second story sleeping balcony is covered



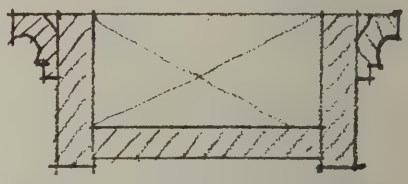
Section of Plate Rail in the Dining Room—Scale 3 in. to the Foot



Detail of Corner Beams in Dining and Living Rooms—Scale 3 In. to the Foot



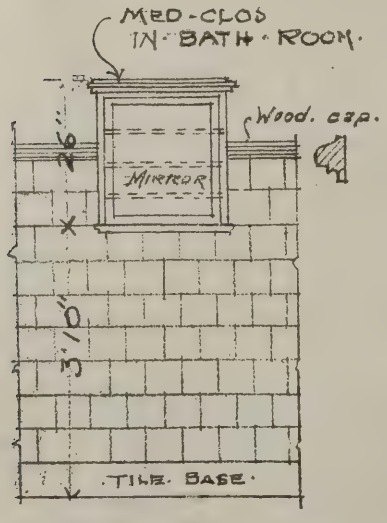
Right Side Elevation—Scale 3/32 In. to the Foot



Section of Center Ceiling Beams in Dining Room—Scale 3 In. to the Foot



Left Side Elevation—Scale 3/32 In. to the Foot



Cement Wainscoting in the Bathroom—Scale ⅜ In. to the Foot



Rear Elevation—Scale 3/32 In. to the Foot

with heavy tin, which was painted two coats on the under side before being laid.

The sheathing used for the main and dormer walls was 7/8 x 10-in. hemlock. Over this was laid heavy building paper, which received wood lath spaced 16 in. on centers to serve as support for the painted expanded metal lath. Stucco mixed in the usual proportions was applied, the last coat being composed of white cement and marble dust worked to a "spatter dash" finish. Green terra cotta tile were set in the stucco.

The floor of the sleeping balcony was constructed of 7/8 x 9-in. yellow pine boards, the floor dropping 8 in. below the floor of the house and being pitched to the leader outlet.

The floor of the main porch is of Oregon fir 1 1/8 in. thick. The ceiling is of 7/8 x 4-in. double-beaded tongued and grooved North Carolina pine, finished at the frieze board with a small mold. The pergola at the right is composed of 3 x 8-in. dressed beams. The treads of the porch steps are 1 1/8 in. and the risers 7/8 in. thick.

The frames of the exterior doors are 1 1/8 in. thick. The front entrance door is of oak 1 3/4 in. thick and finished with Wheeler's filler and spar varnish. Plate glass is used for glazing.

The frames of the interior doors are 7/8 in. thick. On the first story the doors are 1 3/8 in. thick and of the five-panel type. The second story doors are of veneered birch, which were given one coat of filler, one coat of medium mahogany and one coat of Flatine.

The windows are mostly of the double-hung type, having 7/8-in. pulley stiles, 1/2-in. parting strips, 1 3/4-in. sills, and 1 1/8-in. outside casings. Windows which are of the casement type include the high windows in the Den, on the main staircase and in the third story gables. The sash throughout are of clear white pine 1 3/8 in. thick and divided by wooden muntins.

For the plaster base spruce lath were run horizontally, with joints broken every tenth course, and steel corner beads were used at all interior angles. Metal lath was used where necessary at brick walls and partitions. The plastering was three-coat work throughout, the last coat being troweled to a hard white finish.



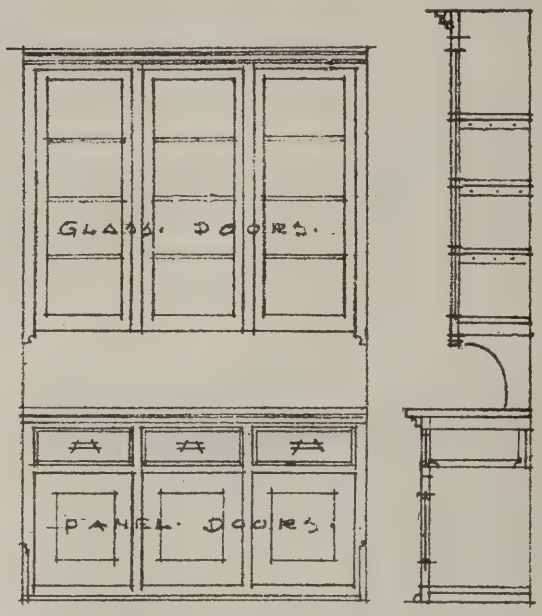
THE DINING ROOM AS VIEWED FROM THE LIVING ROOM, LOOKING DIRECTLY TOWARD THE EXTENSION WINDOW SHOWN AT THE EXTREME LEFT ON THE PLAN

The floors throughout are double. The sub-floor is of 7/8 x 9-in. tongued and grooved hemlock over which was placed deadening felt. On top of this, in the main rooms on the first floor, was laid first quality 7/8 x 2 1/2-in. straight sawed oak. This was given at completion two coats of shellac and one coat of Johnson's floor wax. Other finished floors consist of 7/8 x 2 1/2-in. first-quality comb-grained Alabama pine, given one coat of shellac and one coat of Johnson's floor wax.

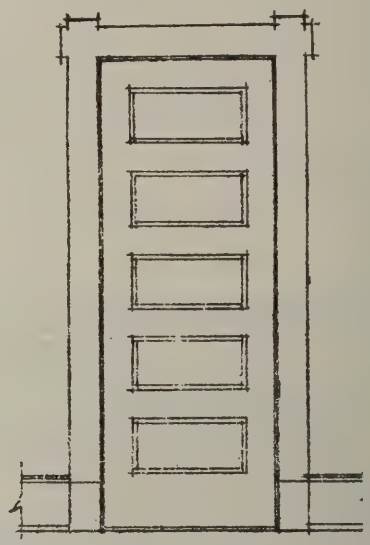
The main stairs are of oak, with 1 1/8-in. treads

and 7/8-in. risers, there being a small mold under each nosing. The balusters are 1⅜ in. square, three to a tread; the rail is 2½ x 3 in., while the newels are 6 in. square and boxed with molded cap and base. The side of the stairs facing the Den in the living room and dining room 3 x 4-in. beams are used. The dining room ceiling has 3 x 7-in. built-up beams.

The living room and dining room, also the living room and Den, are separated by means of buttressed



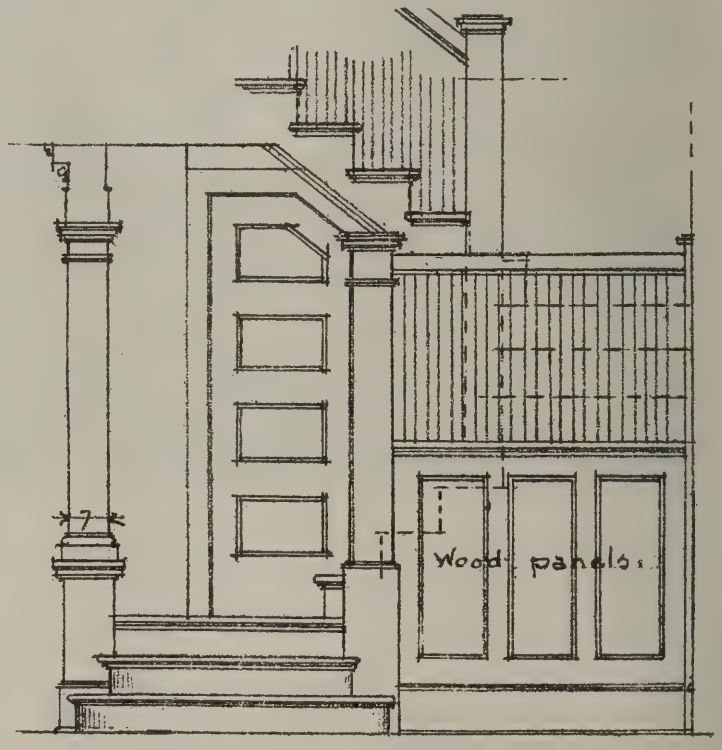
Elevation and Section of the Cupboard in the Pantry—Scale ⅜ In. to the Foot



Elevation of Typical Interior Doors and Trim—Scale ⅜ In. to the Foot



Elevation of Cupboard in the Kitchen—Scale ⅜ In. to the Foot



Front of the Main Stairs as Viewed from the "Den"—Scale ⅜ In. to the Foot

is paneled as shown by the detail presented on this page of the article.

All trim in the main part of the first story, including the stairs, is of oak, which was given one coat of filler, one coat of light stain, and one coat of Flatine. At the junction of the wall and ceiling openings 7 ft. 6 in. high, the side and head casings being the same as those of the doors and windows. Turned columns of 6½ in. diameter with cap and base flank each side of the openings, and the pedestal is raised 2 ft. 6 in. above the floor, as shown in the detail.

The bay window in the living room has built-in seats, the tops of which are hinged to raise and the fronts panelled. The dining room plate shelf is 6 ft. above the floor.

The living room fireplace is built of pressed brick. The back lining and back hearth are of firebrick, the front hearth being of red tile.

The second story trim is of whitewood, which was given three coats of white paint.

The bathroom walls were plastered with Keene's cement, metal lath being used to a height of 5 ft., and the finishing coat was laid off into 6-in. squares to imitate tile. The floor is of 1-in. white hexagonal tile laid in cement and provided with a 6-in. tile base with rounded top and cove bottom. There is a medicine closet 22 in. wide by 26 in. high, with a bevel plate mirror in the door and with four shelves ½ in. thick on cleats. The bottom of the closet is 3 ft. 8 in. above the floor and the top has a molded cap.

The bathroom fixtures were made by the Hotchkiss, Vail & Garrison Company, and include a 5-ft. enameled iron bath tub, a "Gainsborough" enameled iron lavatory with integral back and concealed hangers, an "Emmet" siphon jet water closet with "Bristol" low-down tank with dark mahogany seat and cover.

The kitchen trim is of cypress, which was given one coat of filler and one of varnish. In constructing the hearth, boards were cut in between the beams 3 in. below the top of the floor joists, and on these was placed 3 in. of concrete with a 1-in. top dressing of tinted cement marked off into squares. The kitchen is fitted with a Richardson & Boynton range.

The house is fitted with combination gas and electric fixtures for lighting. The heating equipment includes an ideal steam boiler of the American Radiator Company make and covered with plastic asbestos cement applied in two coats to a total thickness of 1¼ in., the outer coat being troweled to a smooth, hard finish. The boiler is connected with the terra cotta flue by an iron smoke pipe. The feed pipes in the basement are hung with iron pipe hangers and covered with ¾-in. wool felt sectional pipe covering, which was fastened to the piping by brass straps. The piping to the second story radiators is exposed in the first story. Where the pipes pass through the floors and ceiling they are fitted with nickel-plated floor and ceiling plates.



VIEW IN THE LIVING ROOM OF THE LAWRENCE HOUSE LOOKING TOWARD THE OPEN FIRE PLACE IN THE ANGLE BETWEEN THE DINING ROOM AND THE DEN

Five-inch heavy galvanized iron gutters are provided on the main roof, being supported by iron hangers run well up under the asbestos shingles. The leaders are 4-in. round corrugated galvanized iron supported by leader hangers and run into iron pipes 6 in. above finished grade.

The chimney is flashed and counter-flashed, a gusset being formed in back. All flashings were given two coats of paint on the under side before being laid.

This stucco-coated dwelling is located at Pelhamwood, N. Y., and was built for Mrs. M. Lawrence in

accordance with plans and specifications prepared by Architect W. S. Moore, 30 East Forty-second Street, New York City.

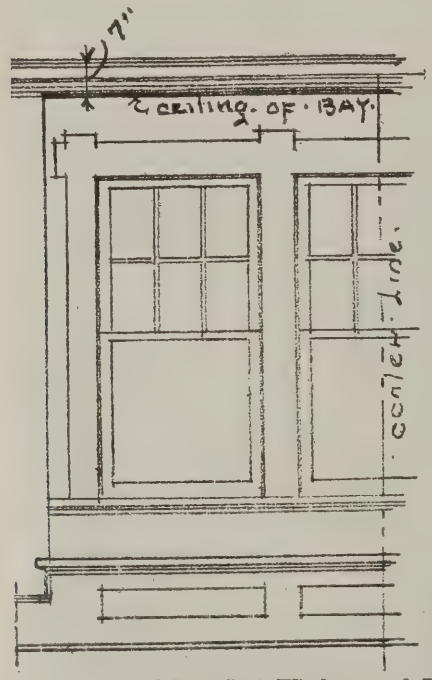
The contract for the construction work was executed by Malcom Johnson, 12 Hillcrest Avenue, New Rochelle, New York.

ARBITRATION FOR CLEVELAND BUILDING TRADES

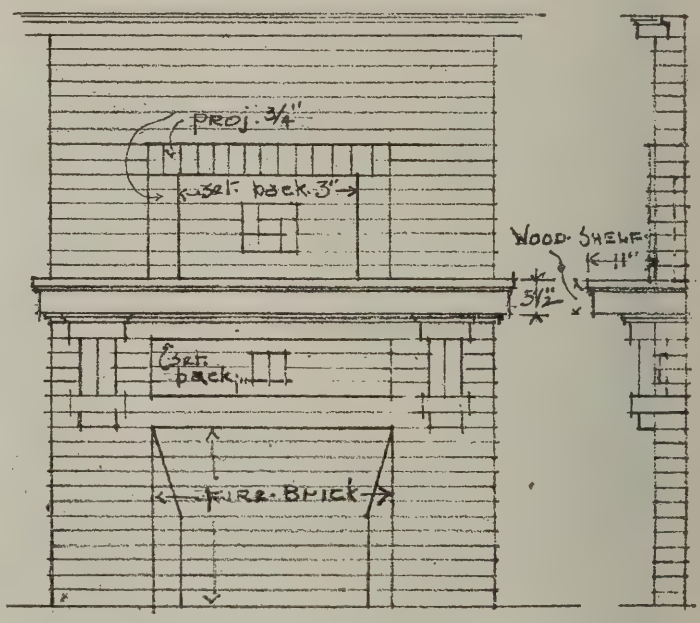
An important victory in the fight for arbitration of labor disputes was won by employers in the building trades in Cleveland, Ohio, the last week of March, in the settlement of a controversy that resulted from the refusal of unions to observe their written arbitration agreements. Most of the Cleveland building contractors, including the sheet metal contractors, belong to the Building Trades Employers' Association, of which George F. Thesmacher of The Riester & Thesmacher Company, sheet metal contractors, is president. The local unions in the building trades are members of a general organization known as the Building Trades Council. For about two years the building contractors have recognized the unions and have made written contracts with the various locals, each containing clauses providing for the arbitration of differences.

Some time ago the Building Trades Council decided to ignore written contracts and that all agreements between unions and employers must be contingent on the will of the council, thus assuming the right to order strikes at any time, regardless of the agreements. Following this announced policy, the unions have been violating their agreements and calling strikes on various pretexts until the situation became unbearable. The contractors, after various unsuccessful efforts to end the dispute by peaceable means, declared a lockout, which affected about 20,000 men and tied up building work in the city for a month. The Building Trades Council finally accepted the demands of the contractors for arbitration of differences and made other important concessions.

Under the terms of the agreement disputes between workmen and their employers are first to be submitted to a committee of workmen and employers in the respective trade. If this committee is unable to settle the controversy, it is to be submitted to a conciliation board composed of seven members of the council and seven members of the association, and there is to be no strike or lockout until this board has had ample time to attempt to arrive at an agreement. The agreement also contains provisions that there shall be no limitations as to the amount of work a man shall perform in a day; no restriction in delivery or use of material, except prison-made material; no restriction in the use of apprentices, and gives the employers the right to employ or discharge whoever they see fit.



Partial Elevation of Bay Seat Windows and Trim in the Living Room—Scale ⅜ In. to the Foot



Front and End Elevations of Brick Fireplace in the Living Room—Scale ⅜ In. to the Foot

MISCELLANEOUS DETAILS OF A STUCCO-COATED SUBURBAN RESIDENCE

The Master Mason Association of Detroit, Mich., which is now affiliated with the Mason Contractors' Association of the United States and Canada, has recently inaugurated a membership campaign with a view to making the organization one of the strongest in that section of the country. President George D. Nutt states that the membership committee will work actively until every desirable mason contractor in Detroit has been given the opportunity to join the organization.

THE BUILDERS' SIDEWALK PLATFORM

WHAT IS KNOWN IN ENGLISH PRACTICE AS A "BUILDERS' GANTRY—DETAILS OF CONSTRUCTION

IN passing along the streets of almost any of the larger cities of the country, the casual observer cannot have failed to notice in connection with the construction of a building that the sidewalk in front of it was covered with a raised platform of heavy timbers from which the building operations were being conducted. This platform is for the double purpose of protecting pedestrians from possible injury in passing along in front of the structure and at the same time serve as a base from which building materials can be hoisted as the work of construction progresses. This raised platform is known in England as a "Builders' Gantry," and the illustrations and descriptive particulars presented herewith relating to it are taken from an article contributed by a correspondent to a late issue of the *Building World* of London. The details afford the reader an excellent idea of the manner in which the "Gantry" is built.

Referring to Figs. 1 and 2, which represent in the one case a front elevation of two bays of the sidewalk platform and in the other a sectional elevation wherein similar letters indicate similar parts, "A" is a 12 x 12 in. fender; "B" are sole pieces 8 x 4 in.; "C" are uprights or supporting posts 8 x 8 in.; 'D" are heads of the same size; "E" are 9 x 3 in. joists; "F" are 4 x 3 in. struts; "G" is 9 x 3 in. sheeting, or it may be 9 x 1½ in. as at "H." The guard frame "J" is 4 x 2 in.; the guard boarding "K" is 6 x ¾ in.; the cleats "L" are 9 x 4 x 3 in.; the handrail "M" is 4 x 3 in.; and the impost "N" is 8 x 4 in. The dogs, two styles of which are shown in Figs. 5 and 6, are made out of ¾ in. square iron.

The correspondent in describing the method of construction continues: The bays may be spaced out into spans ranging from 6 ft. to 10 ft. in the length of the gantry, and into one or two bays in the width from building line to curb. The timber generally used for standards and heads is square, but commonly any section, from 9 in. x 3 in. up to 12 in. x 12 in., is used.

In erecting the gantry, the practice is to first lay down the sole pieces, then set out the position of the standards on them. These standards are then cut off to the required length, allowing for the difference in level owing to the fall of the footway. The uprights are now placed in position, dogged to the sole pieces, and temporarily braced with scaffold board or any other handy material.

The heads are next laid on the uprights and dogged to them; the bridging joints are thrown across the heads and spiked at from 15 in. to 2 ft. centres. Those coming immediately over the uprights are dogged to the heads with those shown in Fig. 3.

The gantry may now be braced as shown in Figs. 1 and 2. Fig. 2 shows three different methods of

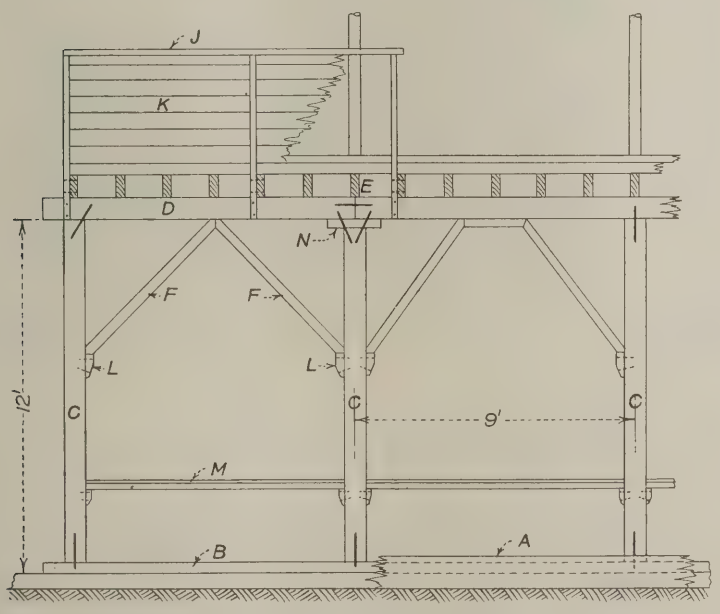


Fig. 1—Front Elevation of Two Bays of Platform Covering the Sidewalk and Showing the Construction

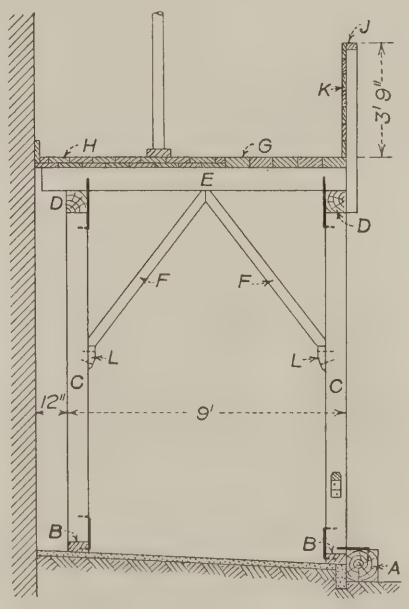


Fig. 2—A Sectional Elevation with Parts Lettered to Correspond with Fig. 1

cutting the braces in general use. Fig. 3 illustrates an impost piece, used for giving a greater bearing surface where a joint occurs in the head.

Fig. 1 illustrates two methods of sheeting. If the 9 in. x 3 in. sheeting be used, then the whole area of the platform should, previous to laying the deals, be covered with tarred felt, to prevent water percolating through to the annoyance of the public. Or, if double sheeting scaffold boards be used, the joints both lateral and heading should be lapped. The platform is then sanded and the sand worked into the joints with a broom. The guard frame is fixed and boarded to the height shown in Figs. 1 and 2.

The fender may now be laid in the gutter and dogged to the uprights, and the handrail fixed to cleats between the upright, at from 3 ft. to 3 ft. 6 in. from the ground. Fig. 4 shows how the end of the fender should be cut so that any vehicle coming in contact with it will glide off.

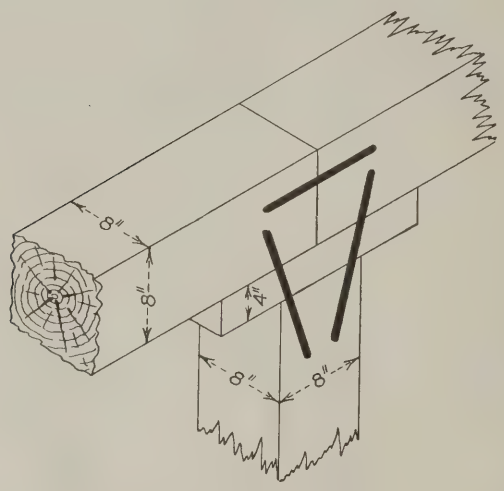


Fig. 3—Detail of the Construction at Top of One of the Supporting Columns

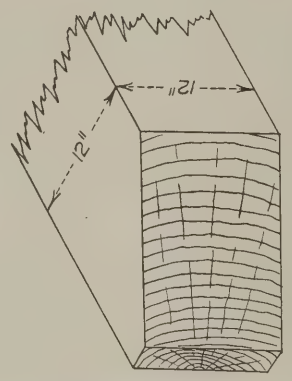
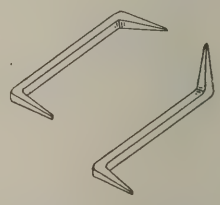


Fig. 4—Method of Finishing End of Fender "A" of the Elevation



Figs. 5 and 6—Two Styles of Dogs

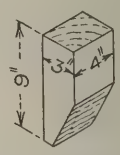


Fig. 7—Enlarged View of Cleat Supporting a Brace

Figs. 5 and 6 are the types of dogs used in this class of work. They run from 12 in. to 18 in. in length, and with points 2 in. to 3 in. long. That shown at Fig. 5 is used for heading, lateral and shoulder joints, and that at Fig. 6 (which is made with its points at right angles to each other) are used in positions where they hold more effectively than the other, such as the fender to the uprights and the joints to the heads, etc. They are made rights and lefts, or, as it is often termed, in pairs.

Fig. 7 is a view of a cleat as spiked to the upright to receive the thrust of the strut.

The New Era Homes Corporation, 189 Montague Street, Brooklyn, New York, has just acquired property on the east side of Ocean Avenue, running through to East 7th Street and will immediately begin the erection of eleven private dwellings each having eight rooms and bath. The outside of each house will be finished in white stucco and there will be an enclosed porch, parquet floors and all the modern built-in fixtures.

PREPARING UNUSUAL BUILDING FOUNDATIONS

One of the important improvements now under way in the city of San Francisco and brief reference to which has already been made in these columns, is the new Southern Pacific building which will be the largest office structure of its kind west of Chicago. Some idea of the magnitude of the work may be gathered from the fact that it will require 20,000 cu. yd. of concrete, 3500 tons of structural steel, 500 tons of reinforcing rods and twenty miles of piping.

Most unusual, however, in connection with the work is the fact that 2236 piles, 115 ft. in length and reaching 130 ft. below the sidewalk will be utilized in the foundation. The piles are of Douglas fir and were driven by two mammoth drivers said to be the largest ever set up on the Pacific Coast. They were 135 ft. high and the hammer of one of them weighed 16,000 lb.

The piles were crowned with a cap of concrete 5 ft. thick and 16 ft. square liberally reinforced with steel rods. There are 151 of these caps or piers varying according to the weight they are to support.

There are two large concrete plants now on the job pouring 400 yd. of concrete per day, fifteen motor trucks being utilized in hauling sand and broken stone. It is said that the building when completed will weigh 55,000 tons and that the piling weighs 6600 tons.

WAGES OF SAN FRANCISCO CARPENTERS

Beginning Monday, May 21, 1917, union carpenters in San Francisco and the San Francisco Bay region will receive an advance of 50 cents per day in wages and a half day off on Saturday. Heretofore outside carpenters have been getting $5 per day and inside men, millmen and finishers have been working on a sliding scale. The new scale was unanimously adopted by a committee of the employers and a committee from the Building Trades Council at a meeting on February 28th.

SOME MISCELLANEOUS FARM BUILDINGS

DETAILS OF A SMOKE HOUSE, A MILK HOUSE AND A MACHINE SHED, ALL OF CONCRETE

BY W. F. FRUDDEN

THE various buildings which are to be found upon the average up-to-date farm, in whatever section of the country located, constitute a group in which is usually included a milk house, a smoke house and a machine shed or tool house, as the latter is sometimes called, depending altogether upon the specific purposes for which it may be used. In the Central West, and particularly in the State of Iowa, milk houses constructed of concrete are very popular, and they are to be found upon hundreds of farms scattered through that section. Concrete, which resists rot and decay, is the material to use in the building of a sanitary dairy house for any farm.



Fig. 1—A Concrete Milk House for the Farm

The picture presented in Fig. 1 shows the appearance of one of these milk houses as built in the State of Iowa. A plan is found in Fig. 2, while the cross-section, Fig. 3, affords an idea of the construction. The floors and the footings for the walls should be of concrete with a floor drain in the center of the building and another drain from the milk-cooling tank. The latter should be set down in the floor 14 in., as this renders it easy to lift the filled cans from the tank. By reference to the floor plan, Fig. 2, it will be seen that the work table is located at one end of the house. Here is a place for the tester and tools as well as for any other equipment needed in the dairy. The cream separator can be bolted securely to the concrete floor base. A rack for drying the cans is shown near the tank as a matter of convenience. The walls of the house are made of concrete blocks and are plastered on the inside so as to insure clean, smooth walls that will not accumulate dirt and dust. The roof is of frame construction, the rafters being 2 x 4 in., placed 24

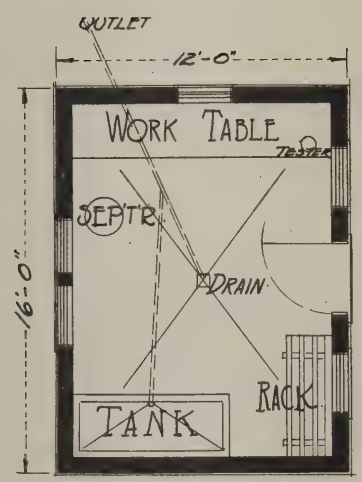


Fig. 2—Floor Plan—Scale ⅛ In. to the Foot

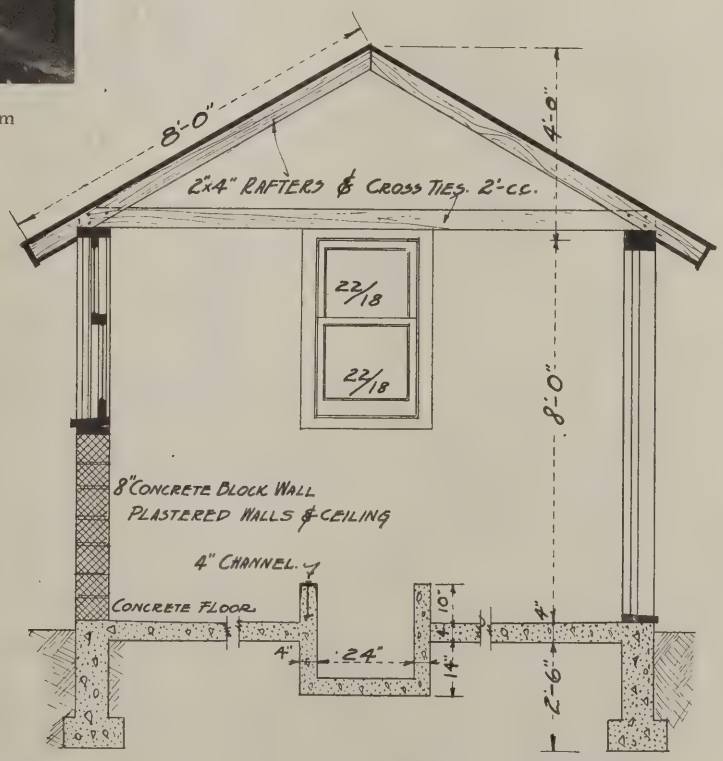


Fig. 3—Vertical Cross Section of the Building—Scale ¼ In. to the Foot

in. on centers and covered with cedar shingles.

In Fig. 4 is shown a practical farm machinery shed and repair shop built of concrete, while Fig. 5 is a plan and Fig. 6 a vertical cross-section showing the general construction which has been followed. The building is 20 x 36 ft., and the walls, floor and wall footings are of concrete. The roof is frame, covered with cedar shingles. The gable ends are of frame, covered with common siding.



Fig. 4—Concrete Machine Shed

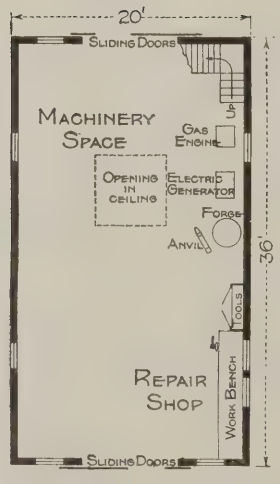


Fig. 5—Floor Plan—Scale 1/16 In. to the Foot

The ground floor of the building will house the heavy machinery necessary on the average small farm, while the lighter tools can be hoisted up into the second story of the shed. The repair work on a farm is best done in a shop, and all should be located in the machinery shed, where the work can be done during the winter months. The gas engine, the electric generator, forge and anvil, the cupboard for the tools, and the work bench are all provided for in this building.

For a shed like that here shown the following Bill of Materials will be required:

40	barrels cement, and 48 yards sand and gravel.
12	pieces 2 x 6 in. x 12 ft. for plates.
8	pieces 2 x 6 in. x 10 ft. for plates.
38	pieces 2 x 4 in. x 16 ft. for rafters.
20	pieces 2 x 8 in. x 20 ft. for joists.
10	pieces 2 x 4 in. x 10 ft. for studding.
1,200	board feet roof sheathing lumber.
11,000	cedar shingles for roofing.
900	board feet ship lap for flooring.
270	board feet siding lumber for gable ends.
10	windows and frames.
4	sliding doors and frames.

In Figs. 7, 8 and 9 is illustrated a concrete-block smoke house with flat roof, which is of such a nature that the work can be done by the farmer at times in the year when farm work is at a standstill. This smoke house is 9½ ft. square, is fireproof and substantial. The foundations and the floors are of concrete while the walls are laid up with common cement blocks. The roof of the house consists of a concrete slab 4 in. thick and reinforced with heavy wire mesh. A 4-in. vent pipe is placed in the center of the roof. A fire box, which may be built as illustrated in Figs. 8 and 9, will mean that the smoke house itself will be kept much cleaner than would otherwise be the case, and the fire can be replenished without entering the smoke house proper. Six barrels of cement, 3 yd. of sand, 5 yd. of gravel and 200 concrete blocks will be needed for the structure.

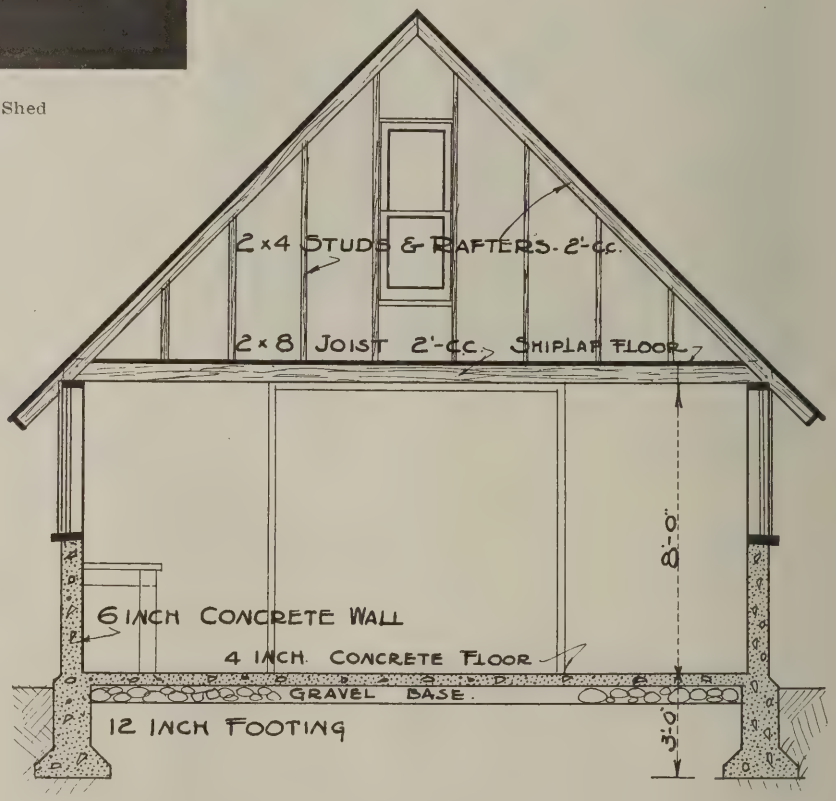


Fig. 6—Vertical Cross Section—Scale 3/16 In. to the Foot

DETAILS OF A CONCRETE MACHINE SHED FOR THE FARM

It pays the farmer to cure his meat, as he saves three or four profits by so doing and can feel sure

that the meat that he gets is first-class in all respects. A smoke house of this kind is therefore worth a place on any modern farm.

A PANAMA DWELLING

The typical Guaymi, Panama, dwelling is a round house about eight meters in diameter, with a conical thatched roof. The bare ground constitutes the floor, and the fireplace is either in the middle or at the side. These houses are not always walled; when they are they have no windows, but two doors placed at the opposite end of a secant to the circumference of the structure. The walls are made of erect bricks brought close together and tied with vines. On the north side, plaster made of cow dung and clay is sometimes applied, so as to afford a protection against the wind.

Benches along the walls are used as beds, although in high altitudes, where the temperature is very low at night, the resting place is on a light floor just under the roof. Large nets hanging from the beams are used in lieu of wardrobe or closet, and the tilling, fishing and hunting implements complete the house furnishings. Their dwellings are located in the midst of the forests of the lower belt, in solitary clearings, far apart, or in the high savannas.

At Katangh, Congo Free State, all the huts are built on one huge platform some little distance out in the waters of a sheltered bay. The platform rises and falls with the surface of the lake, being moored by poles driven into the mud.

The Dinka houses in Africa have a narrow mud wall 4 ft. high. A thatched roof, constructed separately, is placed bodily upon this wall when completed. A small open porch adjoins the front of the house, and several small peep holes are punched around the walls of the hut.



Fig. 7—A Concrete Block Smoke House with Flat Roof

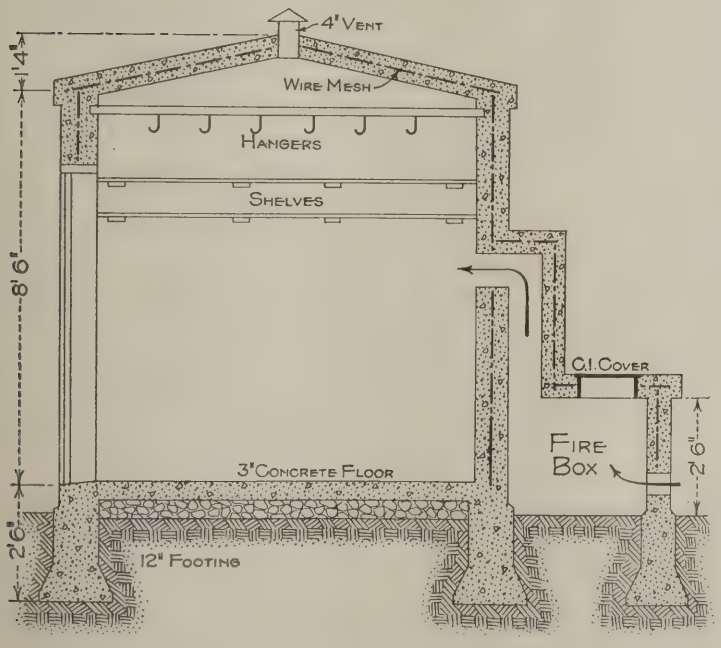


Fig. 9—Vertical Cross Section—Scale ¼ In. to the Foot

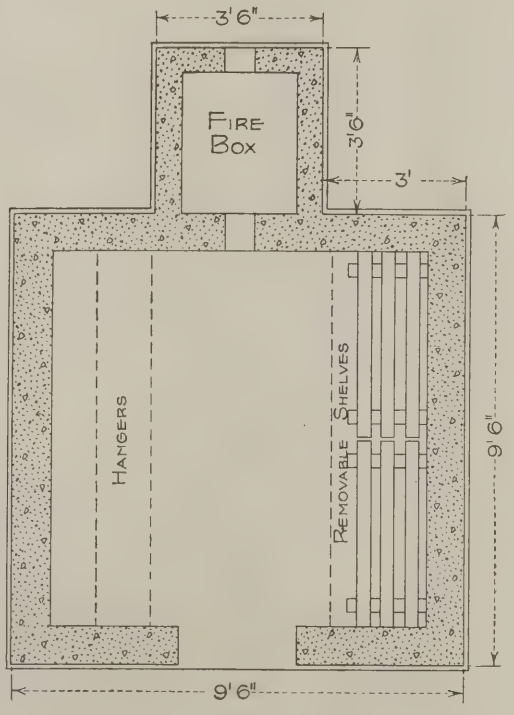


Fig. 8—Floor Plan of Smoke House—Scale ¼ In. to the Foot

DETAILS OF A CONCRETE SMOKE HOUSE

THE COTTAGE ON THE COLORED COVER

A HOLLOW TILE COUNTRY HOUSE OF UNUSUAL ARRANGEMENT—DETAILS OF CONSTRUCTION

THE subject of our colored cover design this month is a country house of the cottage type constructed with walls of hollow tile and finished outside with a coating of stucco. The roof may be covered with any one of a number of materials, although the architect in the present instance specifies slate. The house is semi-fireproof in its construction and is intended to be erected on a lot having a frontage of at least 75 or 100 ft. The building itself measures 49 ft. in length and is 29 ft. in depth, thus readily adapting it to a lot of the dimensions named. The striking features of the exterior are the hooded portico at the main entrance, the porch at the kitchen end of the building and the dormer windows which break the roof lines at front and rear. The rooms within the house are large, well lighted and ventilated and there is space, according to the architect's estimate, for a family of two adults, two children, one servant and with a spare room for guests.

LAYOUT OF THE ROOMS

An inspection of the floor plans presented upon the following page shows direct entrance into a hall which is flanked on one side by a living room extending the full depth of the house and on the other by the dining room. At the rear of the stair hall is a library which can also be used as an office should circumstances require. A narrow hall running for a short distance lengthwise of the house and located just beyond the dining room establishes communication between the kitchen and the main hall, thus giving direct access to the front door without the necessity of passing through any other rooms. This hall also gives ready access to the dining room from either the kitchen or the pantry. From this hall rise the stairs to the second story and under this flight are located the stairs leading to the cellar, these being so placed as to be convenient to the kitchen and pantry. In the basement, which extends under the entire house, is a laundry, a large space for the heating plant, coal bins, storage room for vegetables, etc., etc. The kitchen, which is reached from the end porch already referred to, is fitted with sink placed under the double window in the side wall of the building, a combination gas and coal range and commodious closets. The porch is of such a nature that it can be used as a breakfast room in case of necessity.

On the second floor are four sleeping rooms, a bath room, a sewing room and storage closets. In addition there are two clothes closets opening out of each of the four bed rooms. The hall occupies the center of the house so that every room is readily accessible from it.

According to the specifications of the architect, the basement walls and footings are to be of concrete extending up to the first floor joists. The walls are to be 12 in. thick and the footings are to be 10 in. thick and 24 in. wide. The concrete used is to be mixed in the proportions of one of Portland cement to three of sand and four of broken stones. The concrete floor in the cellar is to be 4 in. thick laid on a bed of 3 in. of cinders.

HOLLOW TILE WALLS

All exterior walls are to be of terra cotta hollow tile blocks measuring 8 x 12 x 12 in. set in a mortar consisting of one part cement to three parts sand with not more than 10 per cent of the mass by volume of well-slaked lime. The tile is to be thoroughly wet before applying the stucco, which is to be two-coat work throughout. The scratch coat is to consist of one part cement, three parts sand and not more than 10 per cent lime putty. It is to be at least a half-inch thick and applied under pressure. The finish coat is to consist of one part cement and two parts sand and is to be 1¼ in. thick.

The roof plates are to be bolted to the hollow tile walls every 5 ft. The roof is to be covered with sheathing boards, over which is to be placed a layer of tarred roofing felt, upon which is to be laid dark greenish slate shingles exposed 5 in. to the weather. All valleys and hips are to be well flashed.

All leaders are to be of a square design and of galvanized iron. Hanging gutters of galvanized iron are to be used where necessary.

THE FRAMING TIMBERS

All interior timbers are to be of spruce with girders measuring 4 x 8 in., plates 4 x 4 in., first floor beams 2 x 10 in. and second floor beams 2 x 8 in., all placed 16 in. on centers and braced with 2 x 2 in. cross bridging. The second floor ceiling beams are to be 2 x 6 in., the main roof rafters 2 x 8 in. and the dormer roof rafters 2 x 6 in., all placed 20 in. on centers. All interior partitions are to be built up of 2 x 4-in. studs placed 16 in. on centers and covered with wood lath, the studs to be doubled at all openings.

The beams are to be set on terra cotta slabs 1 in. thick which are to serve as bearing plates. These slabs are also to be used for working up levels and story heights when the blocks do not work out correctly. All openings are to be spanned by lintels, use being made of special lintel blocks reinforced with steel rods and concrete.

The floors of the rooms in the main story are to be double with a finish floor of maple in the living



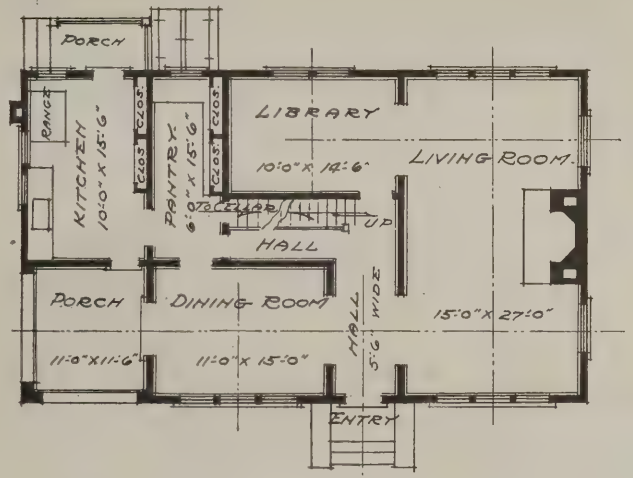
FRONT ELEVATION.



RIGHT ELEVATION



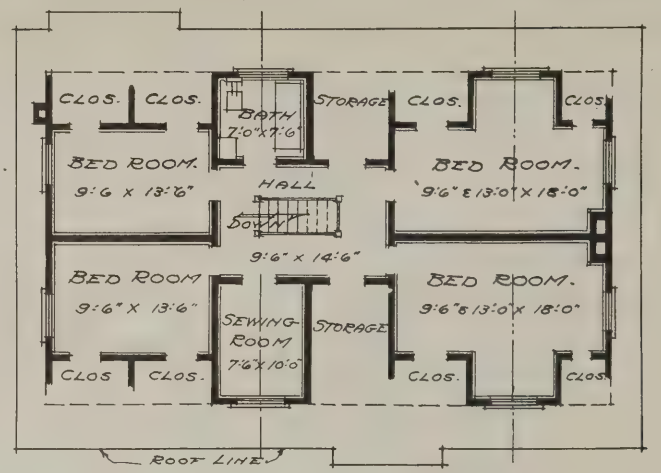
REAR ELEVATION.



FIRST FLOOR PLAN.



LEFT ELEVATION



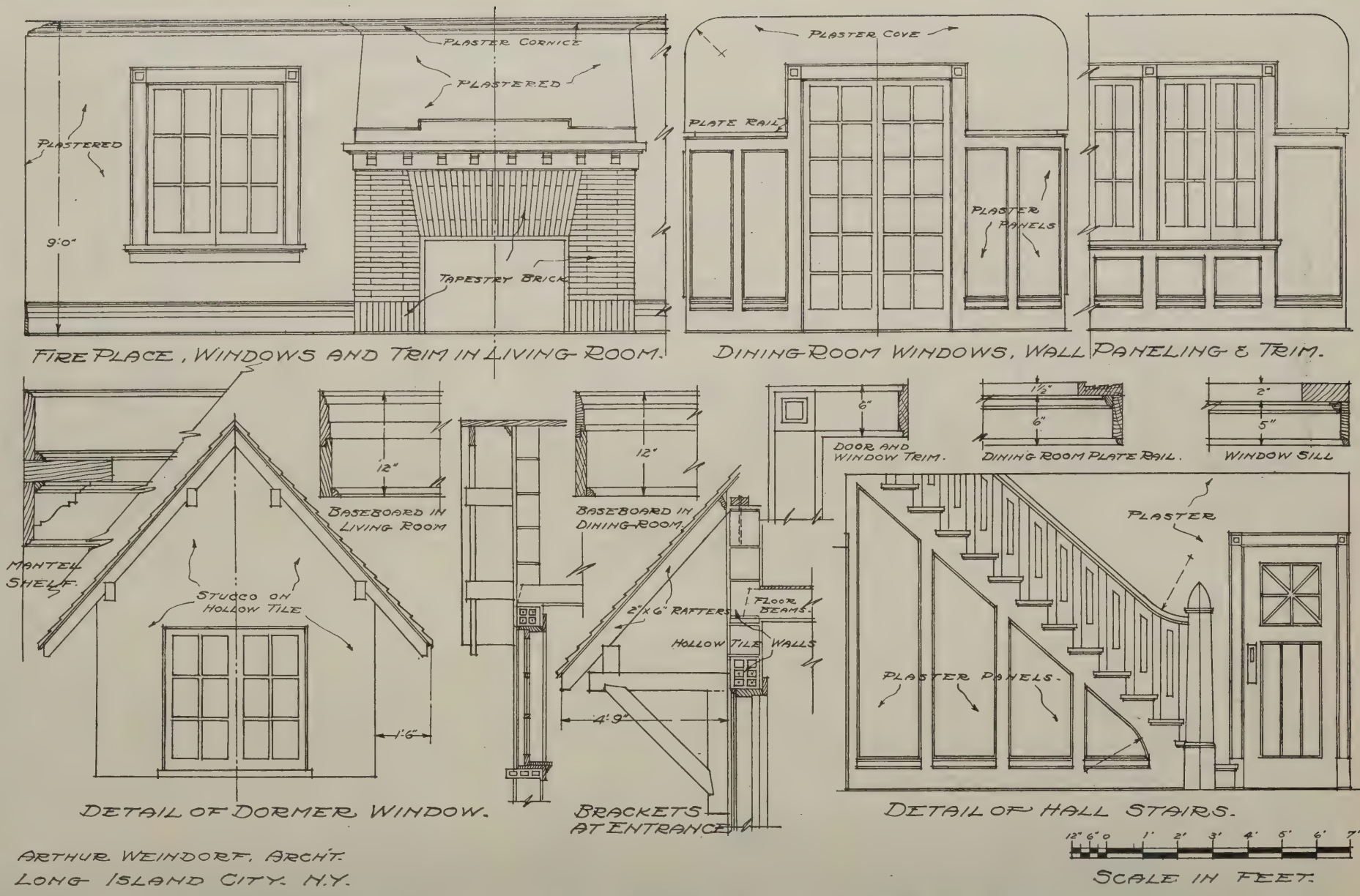
SECOND FLOOR PLAN.

0 4' 8' 12' 16' 20' 24'

SCALE IN FEET.

ARTHUR WEINDORF. ARCH'T.
LONG ISLAND CITY. N.Y.

PLANS AND ELEVATIONS OF THE SUBURBAN COTTAGE SHOWN ON THE FRONT COVER OF THIS ISSUE OF THE PAPER



ARTHUR WEINDORF, ARCH'T.
LONG ISLAND CITY, N.Y.

MISCELLANEOUS CONSTRUCTIVE DETAILS OF THE SUBURBAN COTTAGE SHOWN ON THE FRONT COVER OF THE PAPER

room, the dining room and the main hall. The rest of the rooms are to be finished in comb-grained North Carolina pine. The floors of the rooms in the second story are to be single and of North Carolina pine.

The hall, library, living room and dining room are to be finished in birch or chestnut, stained to imitate mahogany and given a flat Mission finish. The side walls are to be panelled in the dining room and have a plate rail. In the kitchen, pantry, bed rooms and remaining portions of the house cypress trim is to be used and the doors will be of birch and cypress. The bed room trim is to be enameled white and the birch doors are to be stained mahogany.

The plastering in the hall, living and dining rooms is to be two-coat work with a sand finish. All other rooms are to have two-coat work with a hard smooth finish. The plastering is to be applied directly to the hollow tile blocks, as the blocks are arranged to receive it.

The porch and entry floors are to be prepared for tiling and covered with dark red tiles. The hearth of the fireplace in the living room is to be laid up in tapestry brick of a color to match the mantel.

The bath room walls are to be covered with white tile to a height of 3 ft. from the top of the sanitary base, which is to be 10 in. high. The floor is to be covered with 2 in. square white tile.

The chimneys are to be built of brick laid up in good cement mortar, all parts exposed to the exterior being covered with stucco. All flues are to be lined with vitrified flue lining.

The plumbing throughout the house is to be of a standard make, the fixtures to be porcelain enameled with all exposed fittings and pipes to have a nickel-plated finish. Exposed pipes in the kitchen are to be coated with aluminum paint.

The house is to be piped for gas and wired for electricity. All lighting fixtures are to be of a modern design and are to match the hardware in finish. The living room is to have two drop pendants of three lights each and the dining room and library one drop pendant of three lights.

The hardware is to be of a standard make and to be of a dull bronze finish and plain design. Glass knobs are to be used on principal interior doors.

The house is to be heated by means of a hot air system with registers located in all rooms. All material used is to be of the best and the furnace is to be of sufficient capacity to properly heat the building to a temperature of 70 deg. when it is zero weather outside.

The architect estimates the cubical contents of the country cottage here shown to be 39,788 cu. ft., on which he places a unit cost of 21 cents per cubic foot. This figure, however, would not include the contractor's profit. He states that in some parts of the country it could be erected for nearly $1400 less than here estimated and if constructed of timber the cost might be reduced fully $2000.

The design shown upon the front cover of this issue is that of Architect Arthur Weindorf, Long Island City, New York, or care of the BUILDING AGE, 50 Union Square, New York City.

THE LAW AND THE BUILDING TRADES

SOME RECENT AND AUTHORITATIVE COURT DECISIONS AFFECTING ARCHITECTURE

By A. L. H. STREET



WHERE the Golden Rule fails to move an owner to do equity in connection with a building project, a court of law may supply coercive force in a proper case, as is shown by a recent decision of the Minnesota Supreme Court, handed down in the case of St. Nicholas Church vs. Kropp.

Plaintiff advertised for bids for a proposed church building, requiring each bidder to deposit a $1000 certified check to insure entry into contract in the event of acceptance of the proposal. When the three bids filed were opened, defendant's offer to erect the building for $30,973 was found to be the lowest by $3,900, and it was accepted. The same day defendant discovered that through some oversight an item covering structural iron had not been included in his bid; the item involving about $2350. The next day he notified the plaintiff's building committee of the mistake, and declined the contract, unless the price should be increased by $2000. The committee refused to make the concession and awarded the contract to a fourth builder on a belated bid of $32,775, but insisted on claiming defendant's $1000 deposit as forfeited.

Suit followed and the trial judge awarded judgment in favor of the plaintiff church, but, on defendant's appeal, the Minnesota Supreme Court reversed the judgment, holding that the case was a proper one for applying the rule of law that where a mistake made by one party to a contract is of so fundamental character that the minds of both parties never met, or where an unconscionable advantage has been gained, by mere mistake or misapprehension, and there was no gross negligence on the part of the party making the mistake, and where

the other party has not been placed at material disadvantage in reliance upon the contract, a court of equity will interfere to prevent "intolerable injustice." Accordingly, the court holds that the $1000 is not forfeited.

In a case lately passed upon by the Appellate Division of the New York Supreme Court (Hoggson Brothers vs. Spiekerman), it appeared that plaintiff company agreed to build for defendant a residence at Greenwich, Conn., at a price not to exceed $32,000, and on condition that "if on completion of the contract we find that the cost to us, plus 10 per cent profit, is less than the sum named above," the difference should be credited on the contract price.

In litigation over a settlement of accounts, defendant claimed that the "cost" of the work must be limited to plaintiff's expense for labor and material, and the trial judge sustained this contention, but, on appeal, the judgment was reversed, the Appellate Division holding that a due proportion of plaintiff's overhead charges should be included in arriving at the total "cost to us."

"The real cost to plaintiff of doing the work," says the higher court, "in the nature of things, would not be ascertained unless some part of the ordinary charges of maintaining its establishment for carrying on their business was given consideration."

But the court holds that the cost must be limited to the expense of doing the work properly; that there could be no allowance in the builder's favor on the account of repairing work done negligently.

When a building contract requires the contractor to complete the work within a stated number of "working days," the builder is entitled to an allowance of time covering days during which brick and cement construction is delayed by freezing weather, if he can show a well-established custom in the locality of excluding such days under similar circumstances. But in laying down this rule in the case of McQuerry vs. General Bonding & Casualty Insurance Co., the Texas Court of Civil Appeals holds that in the absence of a showing of any such custom, in the light of which it may be fairly inferred that the parties entered into the contract, the builder is not entitled to any extension of time on account of freezing days.

Under a contract to construct a gas plant of common brick "picked for evenness of color," the builder was not bound to use brick of absolutely uniform color; it being sufficient to make selection of as even color as reasonably possible. Furthermore, any right on the part of the owner to complain of lack of uniformity was waived where the brick were used in the presence of his manager, his consulting engineer and the architect. These points were decided by the Iowa Supreme Court in the suit of Birdsall vs. Perry Gas Works.

It was also held in the last cited case that a clause in the contract, making time allowance in the contractor's favor in case of delays on account of "strikes, fires, freight blockades, and any other causes beyond his control," exonerated a subcontractor from liability for delay resulting from failure of a materialman to furnish materials on time, the contract requiring the product of this particular materialman.

The common provision in building contracts, to the effect that no alteration shall be made by the contractor in the work, except upon written order of the architect, frequently forms the basis of controversy as to just what constitutes an "alteration." Some legal light on this point is reflected by the recent decision of the Appellate Division of the New York Supreme Court in the case of Fetterrolf vs. S. & L. Construction Co. The court holds that a change in the roof of a dwelling house, by raising an attic story three feet, necessitating the use of studs three feet longer, constitutes an "alteration," for the cost of which the owner would not be liable in the absence of a written order from the architect authorizing the builder to make the change. On the other hand, it was decided that additional stucco on a foundation wall, required by additional exposure of the walls resulting from the manner in which an independent contractor graded the lot around the house, was "extra work," for which recovery could be had without such a written order. The court said: "A medicine closet was put in each house. The plan did not call for it. That was concededly extra work. In a sense it was an alteration of the plan. Literally everything is an alteration that adds or detracts from what the contract demands. But the medicine closet was not within the contract, while the building of the roofs was, but their form of construction was changed."

There is a rule of law in some of the states under which an employer is not liable for injury to a workman if the accident was caused by negligence of a "fellow servant" of the injured man, unless it appears that the negligent workman had previously manifested such incompetency for his position that the employer was chargeable with negligence in retaining him. In applying this rule, it often perplexes the courts to determine just what employees may be regarded as "fellow servants," for it is well settled that mere employment by the same employer is not sufficient to constitute the peculiar relation; the employees must be engaged in the same general department of the work. It is plain that two carpenters shingling a roof together are fellow servants, and equally clear that a carpenter working on the building is not a fellow servant of a draughtsman in the builder's office. But the border line of the relation is sometimes hard to fix, as shown by the decision of the Georgia Supreme Court in the recent case of Byrd vs. Thompson. There it was decided that a laborer placing a joist on a wall was a fellow servant of a mason who had constructed the wall, relieving the employer from liability for injury to the former through turning of a brick negligently placed in the wall by the mason. In reaching this conclusion, the court cites a decision of the Michigan Supreme Court to the effect that a painter using a scaffold which had been previously used by the carpenters on the same general work was their fellow servant and hence not entitled to recover against the employer because of a defect in the scaffold resulting in injury.

LAYING SLATE AND COMPOSITION SHINGLES

ESTIMATING COSTS—SLATE REQUIRED FOR GIVEN AREAS—ORNAMENTAL ROOFS

BY L. S. BONBRAKE

WE find a far-fetched cry from many metal workers of high-priced material as another cause for their inactivity in pushing out for trade in roofing contracts in all sections.

A retrospective view of the roofing trade conditions of 30 or 40 years ago will show much closer competition than to-day. When building operations were conducted, pine shingles were first and generally the only material thought of as a roof covering at that date, and there was far more disparity in prices then than now. It is interesting in this connection to note that in advocacy of slate in the late seventies, the one item of superiority advanced was the scarcity of timber resulting in shingles being made from stumpage and wind shaken trees.

Forty years ago when shingles of best quality could be had at $4.50 per 1000 pieces and slate, nearly the same price as to-day,* by going out after the work, the writer got it and the tin work with it, keeping the men busy, and making a profit. Slate at about $4.50 to $5.00 per square f.o.b. one's depot in Ohio Valley can be laid with a good percentage of profit for from $7.00 to $7.50 per square. Getting this, the first work to be done after the frame of the building is up, gives a line on the tin work, ridging, finials and a better show for the furnace or heating plant. The advantages for the sheet metal worker now are away ahead of those in years past. He should get out after all the slate work, for he is entitled to it as fully as any sheet metal work he does, as custom has made it so, and he will render a real favor to his customer as his line of work adapts him to good execution, having more or less tin work and ridging in connection.

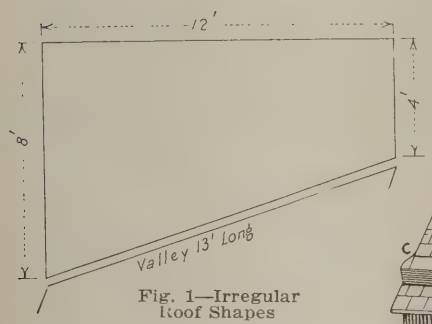


Fig. 1—Irregular Roof Shapes

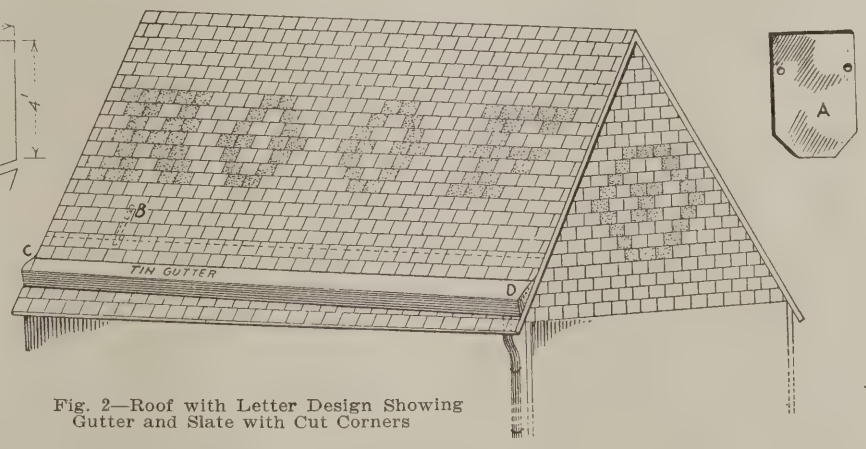


Fig. 2—Roof with Letter Design Showing Gutter and Slate with Cut Corners

Estimates submitted should be carefully gone over and notations made of all items of expense. The sheet metal worker can get f.o.b. prices to his freight yard from any of the many quarries or dealers, after which his own local cost for laying the roof must be added with the overhead expense and desired per cent of profit included. There is no need to go into the amount of business total yearly he may do and the ratio of overhead charges, but rather make an estimate in relation to laying slate alone and the per cent of fixed charges in conducting his business may be adjusted as he deems proper.

First, an item to be carefully observed in handling out-of-town work is to get surface enough to cover that will require at least a minimum carload, as slate cannot be shipped locally on account of the excessive freight charges. One barn, however, as they usually build them in Ohio or Indiana, will have a few left over in a small car. There should be an understanding with the owner of the building or buildings that he or they haul the slate from their nearest railroad siding to the premises where it is wanted, that they also allow storage room for slate not used until its disposal can be directed, that the men are boarded and housed and the horse or horses are fed during the time necessary to execute the contract. At times arrangements have been made for parties receiving slate to pay the freight, which is an item generally about one-half the cost of the material in the territory named.

Having disposed of these matters, the estimate of cost will be narrowed down to the cost of the delivered material, expense of time to and from the work, which will vary according to the distance and conditions, nails per square 20c., vary according to the size of slate (a minor item), 3-ply felt, if not laid

*Advances in the price of slate now prevailing had not been made when this article was written.

on sheeting alone, about 18c., cost of laying, including time going, elevating slate, scaffolding for roof, etc., giving a completed job on barn work or a dwelling. The writer has generally calculated at $1.00 per square and has never found himself far off either way.

For home work, drayage must be considered and extra for work in design. Houses are usually smaller than in the country, costing more in proportion. They usually have gables, dormers, etc., all of which add to the time of laying and to the cost. These matters may be adjusted according to conditions and judgment of the contractor.

FIGURING SMALL OPENINGS, ETC.

In measurement small openings, chimneys, ventilators, etc., are figured as a solid roof. Comb, and hip cap or ridge roll, flashings, chimneys, decks, skylights, etc., are all charged for the same as when done in connection with wood shingles. Hips and valleys are charged for by the foot, adding 1 ft. to their length to make up for loss in cutting the miters which will be noted in Fig. 1. For the number of square feet in this section, add the top, 4 ft. to the base, 8 ft., which will equal 12 ft. Multiply this by half the length or perpendicular which in this roof is 12 ft., so that 12 x 6 = 72 sq. ft., to which add the length of the valley, 13 ft. wastage, and the result will be 85 sq. ft. to be charged for.

It is necessary to charge this loss, as the quarries ship just the exact number of pieces of every size to lay a square allowing 3 in. for the third underlap, as will be seen by the following. Using 12 x 24, a common barn size to demonstrate, take the third lap, 3 in. off, giving 12 x 21. One-half of 21 is the exposed surface or amount in length that slate will cover—12 x 10½ in. or 126 sq. in. A square of roofing 100 sq. ft. or 10 ft. square is equal to 14,400 sq. in. One hundred and fifteen slates or 14,508 sq. in. will be required. The usual house slate 10 x 20 in., 3 in. off, is equal to 10 x 17. One-half of same, 8½, will cover 85 sq. in., requiring 170 pieces covering 14,450 sq. in. This procedure gives the number of slate for all sizes to the square. In some instances where profit alone is the object the workman tries to gain ½ in. exposure. To gain ½ in. to the weather, he loses a whole inch of the third underlap, giving it only 2 in. instead of 3. This is dangerous and should be discountenanced, as sleet or a driving rain is almost certain to be forced up and through, causing a leak, or a pile of snow may drift in the attic. Slate is given for a full, safe lap and if the price cannot be gotten which would justify doing the work well, the particular job should be let alone. However, it is good policy to fully explain the matter to the builder.

SLATE GABLE ENDS

Slate gable ends are frequently seen in different sections of the country in connection with slate roofing and when neatly laid, present a handsome appearance. A roof and gable is shown in Fig. 2, which also shows a slate under the gable with exposed corners cut. Note that in many instances one color only is used, the plain effect being broken by alternating two rows of straight slate with two rows from base to the comb of slate with cut corners. Slate used on gables should be of unfading quality. Never should sea green be used as that grade is liable to turn almost any shade after exposure to the elements. Unfading green or black are most suitable.

LAYING THE SLATE

In starting a slate gable, the same process is observed as in laying a roof. A lath is used under the bottom of the first course which is laid lengthwise. This is done to give a slight pitch so that the bottom of the slate following may fit tight or hug the slate under, which effect is given thereby from the bottom to finish.

A medallion, as shown, or some other suitable design will add a great deal to the appearance of the gable and extra trouble or expense is inconsiderable. When green or black is used for the body, the favorite treatment has been purple for the outer and red for the fine slate inside. However, purple makes a nicer contrast with green than with black. The sides of the gables are laid up tight and finished the same as at the comb and the ends are covered with the frieze board the same as if weather boards had been used.

ROOF GUTTERS

Roof gutters as shown in Fig. 2, are coming into general use, and to a considerable extent superseding the hanging eaves trough. This gutter may be of galvanized sheets which can be bought ready formed in 10-ft. lengths or may be made on the roof as shown by using a 2 x 4 in. stud set edgewise, over the second row of slate, the placing of which is the first thing to do. The 2 x 4 in. stud is given the proper pitch to drain and nailed from the upper side, and lined with tin the same as for wood shingles, except for slate, the tin must be wide, at least 20 in., as shown by cut out of roof at the left gable. The tin should extend several inches above the level of the top of the 2 x 4 in. stud for the back of the gutter (see dotted line D), giving a wide tin or other metal exposure. Allow the slate to again be started in laying high enough up the roof to prevent danger of back water freezing under the slate and in case the water conductors become stopped up, the water will overflow the front of the gutter before it can back up and leak into the building.

The heavy galvanized strip B may be placed at intervals, nailed on the top of the 2 x 4 in. stud and soldered at its upper end, forming a brace which will add to the stability of the gutter.

The end pieces may be made nicely rounded on top, making a much neater appearance as shown by *C* than the ordinary straight piece at the right end. In the majority of localities in the older settlements of the East where farm property is handed down from father to son, they want their name to appear on the road side of the roof when slated and an idea of the manner of procedure to acquire this result on a roof is shown by Fig. 2. A plan of the roof must be drawn and colored slate blocked into

position before the roof is started, the same as in design work, and doubtless your slate dealer can furnish you the alphabet and numbers printed in perfect system and alignment.

The hanging eave trough may be used without nailing through or detriment to the slate by using either means of securing it to the building as shown by Figs. 3 and 4. Nailing through slate to secure eave trough hangers is to be deplored. The probability is that a number of the lengthwise or bottom slate will be broken, the nails will work loose, with the inevitable result of leakage and the material, slate, is condemned for a thing in which it is in no manner responsible.

The parts of a hanger are shown in Fig. 3, with which many thousand feet of trough have been secured. The roof strips *A* are bent to the proper pitch for giving an easy flow of water. At the high point of the trough the strip is bent close up to the bolt hole with each successive one slightly longer to the outlet. These strips are nailed to the sheeting at intervals of nearly 3 ft., the bolt end projecting far enough forward to meet the slot standard when the back of the trough is in position against the facia or molding.

The slate lays nicely over the hanger roof strips as a notch is made in the lath for them to pass through. The cross bar is made with a slight flange

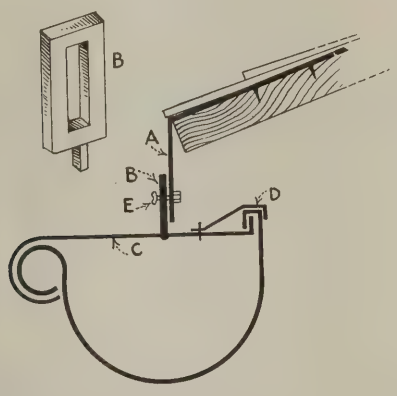


Fig. 3—Adjustable Gutter Hanger

at its back which will engage a fold at the back of the trough, made by snipping in about ⅛ in. or slightly more from the edge at any point desired to meet the roof strip, and is bent down inside of the trough. The back of the cross bar is held in position by means of a turn buckle *D* which is tapped firmly to position over the flange. The front of the cross bar has the usual circular formation to engage the head and an adjustment up and down to meet irregularities, if any, is provided by means of the slotted standard *B* and set screw *E* which is made to bolt up tightly and secure with flat pliers. A hanger of similar character was made in Ashland, Ohio, some 40 years ago.

An eave trough bracket may be made in the shop with holes in the back edge through which to use screws for fastening the bracket to the ends of the rafters or can be bought malleable with a screw shank. The ends of the rafters are lined, giving the desired pitch and brackets placed in accordance. The trough is soldered in length required, carried up to place, the back slipped under the back flange of the bracket, circular formation closed down over the bead and the result is entirely satisfactory.

Having no cross bars a bracket gives a free flow to the water without danger of obstruction from leaves or other foreign matter catching on the bars.

The roof pitch as designated by one-half, one-third, etc., is apparently a hard matter for a great many persons to understand or know exactly what this pitch means. Having had such a plain demonstration given us when a boy that we have never forgotten, it is given as illustrated by Fig. 5 for the benefit of any of the readers who may not know.

Twenty-four inches divided by the fraction of

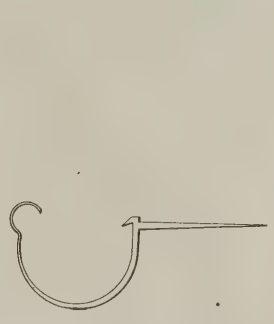


Fig. 4—Gutter Hanger

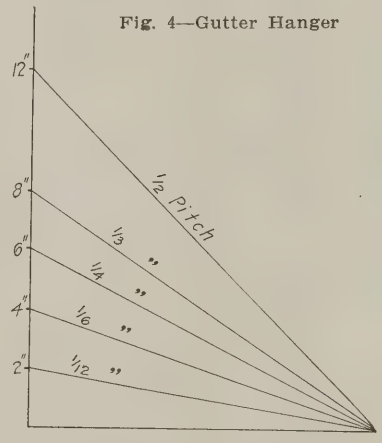


Fig. 5—Different Roof Pitches

pitch named will give the number of inches to the foot by which to describe the pitch line, as, for instance, one-half pitch, ½ of 24 = 12 in. on each blade of the square or one-third pitch, 1/3 of 24 = 8 in. on one blade, 12 in. on the other and so on down the line for any pitch that may be named.

A competitive exhibit is announced to occur in connection with the forty-fourth National Conference of Charities and Correction to be held at Pittsburgh, June 6 to 13 inclusive. The object of the competition and exhibit is to bring to public notice the best examples of management and plans of almshouses or other public homes for the poor, county infirmaries, county hospitals, etc., in the United States and Canada. The general secretary of the Conference is William T. Cross, 315 Plymouth Court, Chicago, Ill.

SAVING MONEY ON CONCRETE "FORMS"

TWO METHODS OF REDUCING COST OF "FORM" WORK — DETAILS OF SPECIAL INTEREST

IT is generally conceded that more or less of the lumber which goes into the making of concrete forms is spoiled for further use, but the really necessary loss—that which is due to cutting lumber for special forms—can be made much smaller than is usually the case by spending a little extra time in the drafting room to properly design the forms and eliminate as many special forms as possible. The Ferro Concrete Construction Company has succeeded in decreasing the cost of its formwork not only by giving the form designs some thought in the drafting room, but also in several other ingenious ways.

An example of the saving in form lumber by paying more attention to the forms in designing the building is the size of columns from floor to floor. Some designers will decrease the column size as the number of floors and the weight above the column grow less. As a matter of fact, the saving in concrete by decreasing the column size is in almost every case materially less than the saving in forms by keeping the column size the same on each floor.



Fig. 1—The Adjustable Shore

In spite of all the savings made possible by careful designing, the cost of formwork represents a very considerable item on the total cost of a concrete building. Two of the ways in which the company named has made very appreciable cuts in its expense for formwork were invented by Mr. Hodges, one of the company's superintendents. One of these is an adjustable shore, which can be used over and over again on all kinds of work. The other is a special system of centering, which includes the use of flexible mats, which can be used from thirty to fifty times. Both of these have proved so successful that they have been patented.

The Hodges adjustable shore, which the company uses, consists essentially of three pieces of lumber, one of which is arranged to slide between the other two, as indicated in Fig. 1, to form a shore of any desired length from 8 to 14½ ft. Two special steel cam clamps fasten the three timbers securely into one solid non-slipping shore. The accompanying illustration shows the general construction of this device.

The mat system shown in Figs. 2 and 3 consists in using a series of mats formed of strips of wood 4½ ft. long, 2½ in. deep and 2 in. wide, fastened together 2½ in. apart by two flexible chains or wires secured about a foot from each end of every rib. The mats are laid on stringers, which are supported in the usual manner. Over the mats are tacked ordinary sheets of galvanized iron. This metal is coated about every other time with ordinary paraffin oil to prevent the concrete from sticking to it when the forms are removed. This metal gives the concrete an especially smooth surface.

That the saving by using this mat system is considerable is evident when one realizes that practically everything in the system can be used over and over again. The stringers are run the long way of the building and allowed to lap over if necessary, so that it is seldom that they have to be cut to short lengths. These stringers can be



Fig. 2—Side View of the Mat System

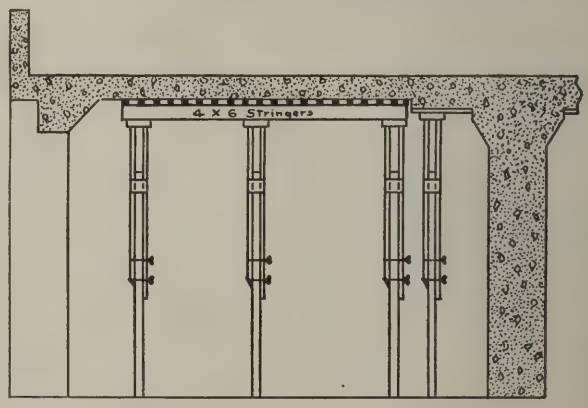


Fig. 3—Showing How the Shores and Mats Are Used

supported by the Hodges adjustable shore, although this is not necessarily a part of the system. The mats seldom have to be cut or made of a special size, because these can be lapped over to give the exact width desired, and the sheet metal used on one job is simply straightened of bends and kinks by putting it through an ordinary hand roller.

Not only has The Ferro Concrete Construction Company been able to use this system on flat slab formwork, but the company has found it almost equally successful on concrete joist construction where the cost of hollow tile, metal, or terra cotta is eliminated.

It is estimated that 15,000,000 bbl. of Portland cement will be used in 1917 in the states of Missouri, Kansas, Oklahoma, Arkansas and Texas.

CAMPANILE AT UNIVERSITY OF CALIFORNIA

A VIEW OF THE FINISHED SHAFT SHOWING ITS ARTISTIC BEAUTY—SOME OF ITS FEATURES

SOME TIME ago we presented in these columns a brief description with picture of the steel framework of what is known as the Sather Campanile located at Berkeley on the campus of the University of California. The work was carried out with funds provided for that purpose by Mrs. Jane K. Sather, a patroness of the University,



THE SATHER CAMPANILE ON THE CAMPUS OF THE UNIVERSITY OF CALIFORNIA

and in the illustration presented herewith we show the appearance of the finished structure.

The Campanile is 302 ft. in height, the shaft being composed of white California granite and the roof of white marble surmounted by a mammoth bronze lantern. The lines of the structure are severe in composition with the exception of the open belfry, which has elaborate frescoing and frieze work set off by ornamental columns provided with artistic capitals.

In the construction of the framework provision was made for resistance to seismic shocks, as buildings in Berkeley suffered more or less damage from the great earthquake of 1906. In the first place the structure was given a heavy steel framework, more than 500 tons of structural shapes being used in the tower-like edifice. Stiff diagonal bracing was placed in alternate panels instead of in all the panels, as is frequently the case, this being done with a view to giving a certain degree of flexibility. The braced panels are made quite rigid, while the unbraced panels—though stiff enough to prevent any excessive swaying—will, it is estimated, allow sufficient spring to prevent shearing of rivets or buckling from concentrated strains.

One of the features of the Campanile are the bells to be hung in the open belfry, these being of the long-waisted Italian type and constructed on an entirely new plan at a cost of $25,000. They are twelve in number and are so arranged that automatic chimes are to be rung, or the chimesmaster from a console in the tower may play whatever melodies come within the compass of the chimes.

From the tower a bird's-eye view of ten counties may be obtained on a clear day, and in comparison with other famous towers of its kind in the world the Sather Campanile ranks second in height.

BEDOUIN HOMES IN ARABIA

The home of the Bedouin is made of goats hair cloth spun and woven by the women. It is very durable and portable, and forms a good protection in all kinds of weather. The tent is spun from an accumulation of many years, and it serves for many generations.

Each camp has its chief, part of whose tent is set apart as the guest room, in which visitors are entitled to three days' hospitality. The Bedouin pities the city dweller because fate has decreed that he must pass his days in the confinement of a house or enclosed city, while the city man congratulates himself on his good fortune on his being spared the dangers, inconveniences and exposure that are the lot of the tent dwellers.

The Bedouins at Tunis have utilized the older cisterns that look like great caverns that were built by the Romans and make houses out of them. The Bedouins who cannot find room in these cisterns use tents, that they pitch under the shelter of some prickly pear hedge to break the sharp wind that sweeps over Carthage in the winter months.

A DUTCH COLONIAL COUNTRY HOUSE

A DESIGN PROVIDING SIX ROOMS AND BATH—VARIOUS DETAILS OF CONSTRUCTION

THE Dutch Colonial type of country house is one which has been popular for years almost without number and it is to be found in all sections of the country. The example which we have taken this month for the basis of our colored supplemental plate is a two-story affair of this nature with living porch extending entirely across one end of the house. Noticeable features are the dormers at front and rear, which break the roof lines, the outside chimney at either end gable and the recessed main entrance. Interiorly, the living room and the master's bed room, both of which extend the entire depth of the house, are among the features likely to command more than passing attention.

LAYOUT OF ROOMS

The architect has provided six rooms and bath, with main hall 7 ft. wide, from which rise the stairs to the second story, extending through the center of the house. At the rear of this hall is the entrance to the flight of stairs leading to the cellar, and there is also an entrance at grade at this point. The arrangement is such that the main flight lands in the center of the second floor, a wide platform occurring halfway up, and lighted by a window in the second story. The porch extending across the end of the house is reached from the living room through French windows. The kitchen is well equipped with range, boiler, sink placed under a window in a rear wall, a commodious pantry, also lighted by an outside window, and adjoining the rear entrance is a space for the refrigerator, thus avoiding the necessity of the iceman entering the kitchen proper.

On the second floor are three sleeping rooms and bath room, together with ample clothes closets. The stairs, as already mentioned, are so located as to land in the center of the house, and therefore hall space is reduced to a minimum, while at the same time giving ready access to all the rooms on that floor.

FOUNDATIONS

According to the specifications of the architect, the foundations are to be of concrete 12 in. thick, the mixture being in the proportions of one part of Portland cement to two parts of sand and five parts of broken stone. The walls rest upon a spread footing of concrete 10 in. thick and consist of the same mixture as that mentioned. The footings project 6 in. on both sides of the wall.

The piers for the porch, extension, etc., are of concrete 10 x 10 in. in section, and start 4 ft. below grade on footings projecting 6 in. all around.

The cellar walls are to be waterproofed on the outside with hot tar and asphalt or other waterproofing cement. The cellar floor is to be finished with concrete resting on a bed of cinders, and with a finishing coat of cement mixed in the proportion of one to three.

FRAMING TIMBERS

The main structure is to be of balloon frame covered on the outside with sheathing boards over which is to be placed a layer of heavy building paper, and this in turn covered with shingles laid in regular courses and exposed 5½ in. to the weather. The roof is also to be covered with shingles laid in regular courses and exposed 5½ in. to the weather. The porch roof is to be of tin.

The exterior cornice is to be of plain design, as are also the porch columns, etc. All windows as shown on the elevations are to have shutters.

The framing timbers are to be 6 x 8-in. yellow pine for the plates, 2 x 4-in. studs placed 16 in. on centers, first floor beams 2 x 10-in. spruce or yellow pine, the second floor beams to be 2 x 8 in. and the rafters to be 2 x 6 in., all placed 16 in. on centers. All interior openings more than 3 ft. in width are to be bridged with "A" trusses.

The entire first and second floors are to be plastered two-coat work with hard white finish. Spruce lath 4 ft. long are to be used with joints broken every seventh lath. Metal lath is to be placed over the heater in the cellar and plastered.

All ridges, hips as well as around dormers and top of sash, are to be flashed with tin. The leaders and gutters are to be of galvanized iron, the leaders to discharge on the ground.

A neat, plain pattern of hardware is to be provided and set, and all necessary locks and window catches, rough hardware, etc., are to be installed.

The bath room is to be provided with cement and cinder fill floor and finished in white tile of small pattern with a tile base all around.

THE PLUMBING

The plumbing fixtures are to be set as shown on the plans presented herewith, and the main soil pipe is to be 4-in. cast iron with main vents of 3-in. cast iron. There is to be a set of two tubs in the cellar laundry properly connected with the main soil pipe and vented.

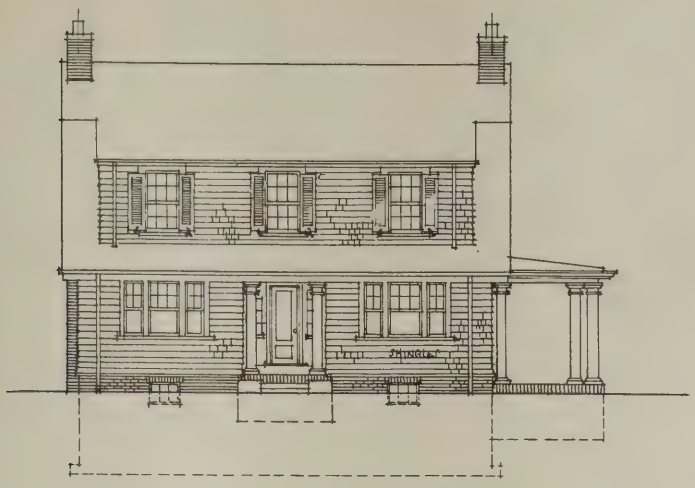
The house is to be heated with hot-water system, and radiators in all rooms except the kitchen to be connected to the heater in the cellar.

All necessary pipes, bends, elbows, floor caps, radiators and necessary appliances for a complete heating system to maintain a temperature in the building of 70 deg. in zero weather are to be furnished.

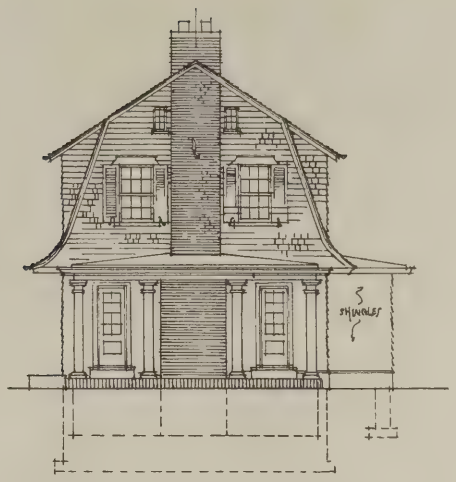
The house is to be piped for gas throughout and



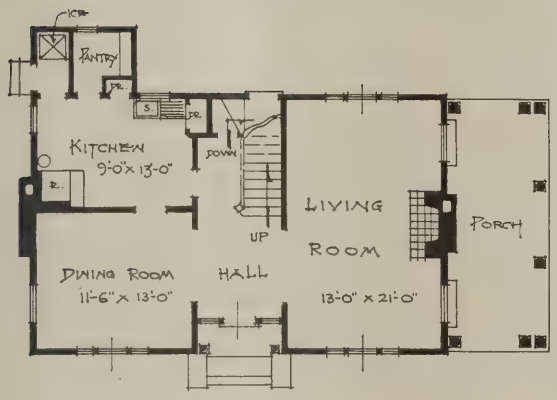
BUILDING AGE
NEW YORK



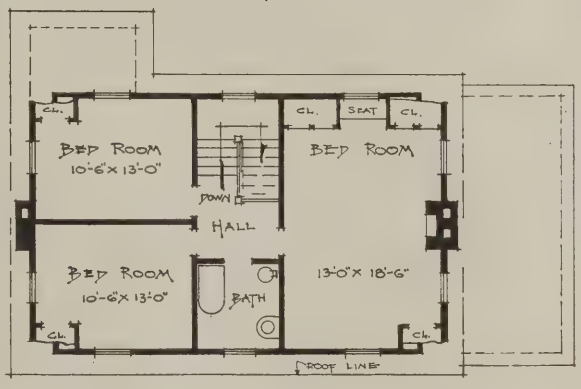
FRONT ELEVATION



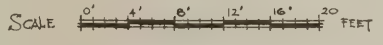
SIDE ELEVATION

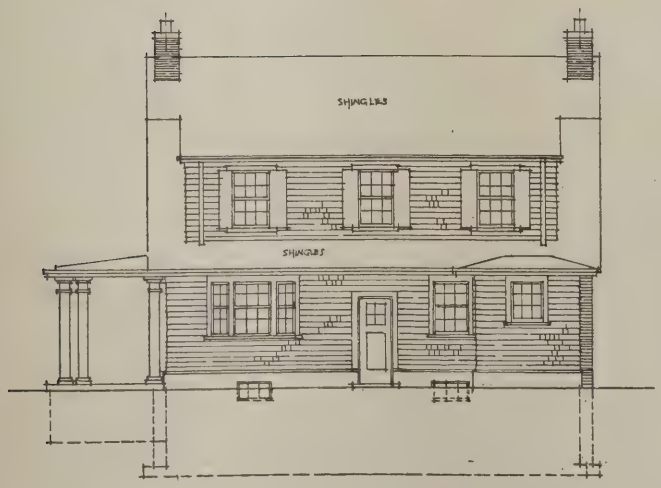


FIRST FLOOR PLAN

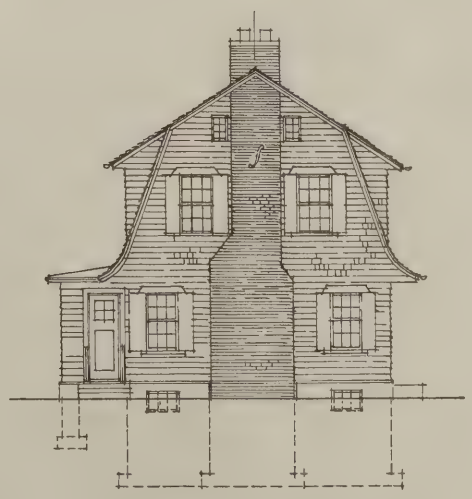


SECOND FLOOR PLAN



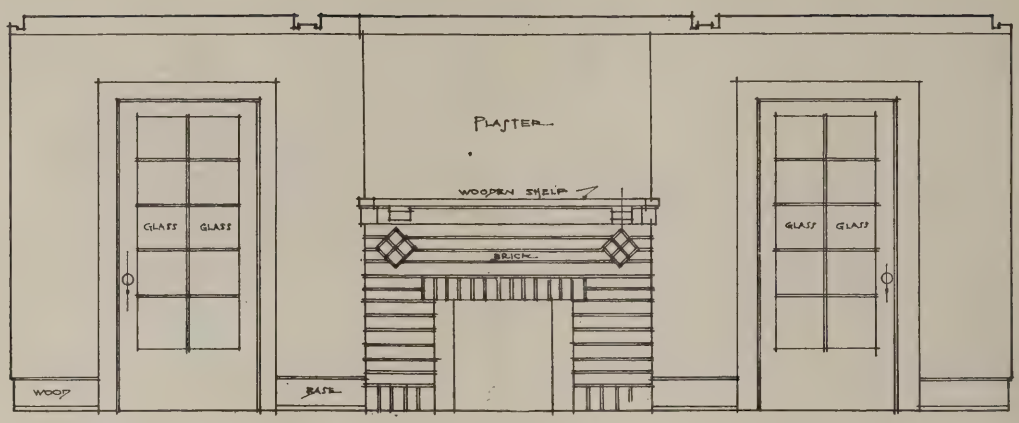


REAR ELEVATION



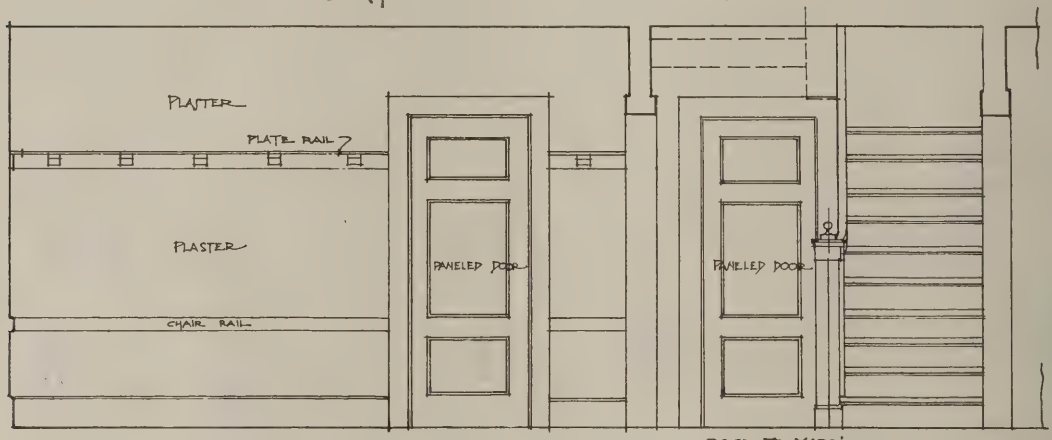
SIDE ELEVATION

PLANS AND ELEVATIONS OF DUTCH COLONIAL HOUSE SHOWN ON SUPPLEMENTAL PLATE



DOOR · TO · PORCH FIREPLACE DOOR · TO · PORCH

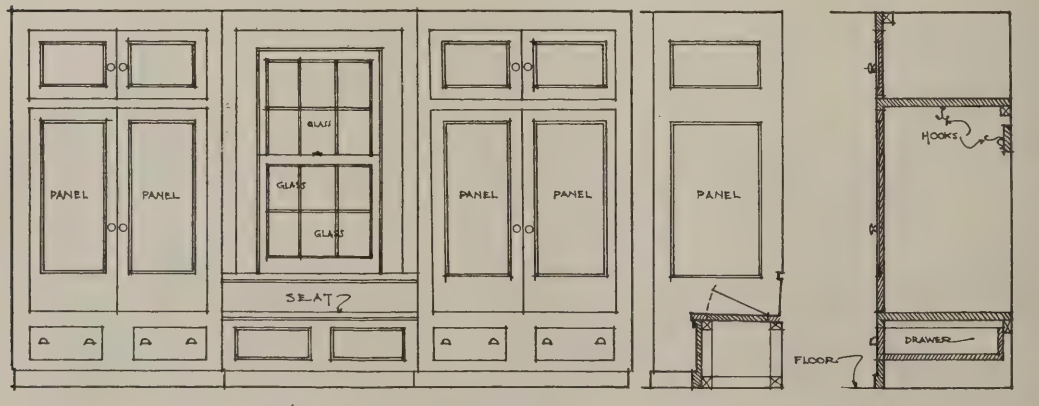
· ELEVATION · OF · LIVING · ROOM ·



DINING · ROOM DOOR · TO KITCHEN DOOR · TO YARD AND · CELLAR STAIRWAY

· DINING · ROOM · AND · HALLWAY ·

· INTERIOR · ELEVATIONS · SHOWING · SPECIAL · FEATURES · OF · DESIGN · FOR · MAIN · ROOMS · OF · SIX ROOM · DWELLING · OF · FRAME · CONSTRUCTION ·



CLOTHES · DRESSER · WINDOW & SEAT · CLOTHES · DRESSER · SECTION · THROUGH SEAT SECTION · THROUGH CLOTHES · DRESSER

ELEVATION, SECTIONS, OF CLOTHES · DRESSERS, LARGE · BED · R'M.

SCALE — 0' 1' 2' 3' 4' 5 FEET
(FOR · ALL · ELEVATIONS)

CONSTRUCTIVE DETAILS OF DUTCH COLONIAL HOUSE SHOWN ON SUPPLEMENTAL PLATE

also wired for electricity. The fixtures are to be of the combination gas and electric type. All electric lights are to be controlled by push-button switches.

The mantel in the living room is to be constructed of brick with a plain neat shelf.

The kitchen range, with smoke pipe, damper, etc., is to be connected with the hot-water boiler.

The entire exterior of the house except the shingles is to receive three coats of paint, ground in linseed oil. The shingles are to be dipped before laying and then stained.

The woodwork in the living room and the dining room is to be stained dark brown while the woodwork in the kitchen is to be varnished. The trim in the bed rooms is to be filled and varnished. The floors are to be varnished.

According to an approximate estimate of the architect, the cubical content of the house is 24,517 cu. ft., on which he places a unit price of 22 cents per cubic foot. This figure, he points out, includes the builder's profit, but does not cover any special locality or section throughout the country, as prices of material and cost of labor will vary according to the particular section in which it may be built.

The design is that of Frank T. Fellner, 413 Caton Avenue, Brooklyn, N. Y., or care of THE BUILDING AGE, 243 West Thirty-ninth Street, New York City.

SOME "KINKS" FROM A CARPENTER'S DIARY

PRACTICAL COMMENTS ON VARIOUS PHASES OF CARPENTRY WORK OF INTEREST TO THE CRAFT

BY HAMMER AND SAW

ONCE during my experience as a carpenter, I had the opportunity of working on one of these so-called "hurry-up" houses—built while you wait at $4.90 and upwards and guaranteed to fit. The sketches which I am sending give an idea of the plan and some of the details. When the contractor who built the State road came along in April, 1913, he wanted a "commissary" erected

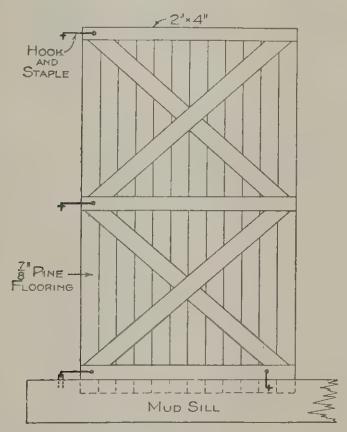


Fig. 1—Side Elevation Showing Method of Fastening the Panels Together; also to the Mud Sill

to house his men who for the most part were Italians. He wanted it built quickly and cheaply, so after considerable maneuvering among several carpenters he came to me and because I was young and willing to take a chance. I secured the job as head carpenter for ten days on two "shacks," as some call the buildings, while the Italian laborers call them the "Commish."

This contractor had his own ideas as to how the work should be done and after ordering material, consisting principally of 2 x 4 in. hemlock and 1 x 6 in. pine flooring, left three straw bosses and other men to help and took his departure on other business. I had a "kit" of tools and the other men picked up rusty saws, hammers and hand axes and for a time there was the greatest cutting and slashing you ever saw. One man cut some of the boards too short at which a big and jolly Irishman told him to be sure and "cut 'em long enough, then he could cut 'em off again afterwards," if they didn't fit.

As the contractor wanted these houses only for temporary use during the summer season and was

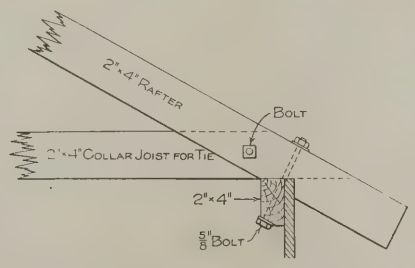


Fig. 2—Method of Fastening Rafter and Collar Beam

intending to move them to other jobs, they had to be built portable, so after some figuring on my own hook, I directed the work in the following manner. I made panels 6 x 10 in. out of flooring and used 2 x 4 for cleats, cut in diagonal braces and hooked the side and ends together with 6-in. hooks and staples, as shown in Fig. 1 of the sketches. The building was to be 18 x 36 ft. and for sills the contractor supplied some bridging

timbers and common railroad ties. We used the best ones for outside and laid the others parallel for girders to receive the lap of the floor panels, these being built the same as the sides. The gable ends were also built in this way.

It will be noticed that the bottom cleat on the side panels is nailed about 4 in. from the end. This allows the end to drop down and cover the mud sill, while the cleat rests flush on top.

The top cleat or 2 x 4, is flush and forms the plate on which the rafters are to rest. The rafters were spaced 2 ft. on centers and secured to the panel by a $\frac{5}{8}$-in. bolt, as shown in Fig. 2. Fastened to every rafter with a bolt was a 2 x 4 to act as a tie across the building. It will be seen that the seat line is cut to fit outside the panels.

The roof was quarter pitch, the rafters being 10 ft. 9 in. No cornice was used and to secure the rafters at the apex, two $2\frac{1}{2}$-in. boards were sawed and bolted on each side of the rafters.

We used for roof boards various widths of 1-in. hemlock, planed one side and nailed them on with 8d nails, one nail in a board to each rafter, so that the boards could easily be pried off. A cheap grade of two-ply tarred roofing was placed on these boards.

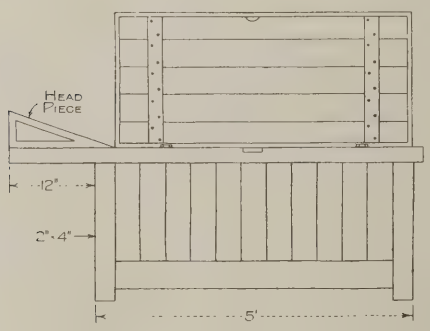


Fig. 3—Detal of Bunk Construction

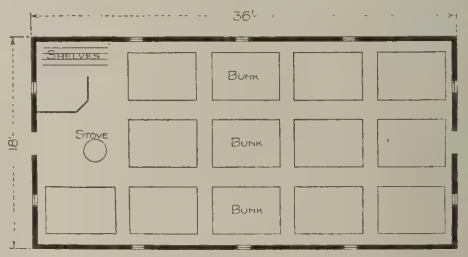


Fig. 4—Plan Showing Arrangement of Bunks

For bunks 2 x 4's and flooring pieces were used as shown in Fig. 3, hooked together with the inside cornice. The cover was also hinged and when closed formed the top, while when open the inside of the bunks formed a recess for the bedding. The bunks were 4 x 6 ft. and the head piece as shown in Fig. 3 was made of pieces of boards and hooked to the top rail so that it could be easily removed.

In the ends and sides there were ten 10 x 12 four-light common barn sash and there was one in each gable end. There was one white-pine door in each end and shelves and a counter were built in one end, with provision for heating by means of a stove, most all of the cooking being done outside. The arrangement is indicated in Fig. 4.

All the flooring in tongue and groove was painted with white lead and oil and the entire exterior received one coat of red paint.

All panels were numbered and two of these buildings were completed in ten days, these having twenty-six bunks with housing capacity of fifty-four men. While I would not guarantee them for permanency, they answered the purpose of the firm every way. I mentioned the fact that a ventilator would be a good stunt for the roof, but the contractor said, "No, they will have all the air they want."

I have found by experience that it is a good thing to always have a couple of colored lead pencils handy, as the black lead answers on wood that is natural color, but on planks such as stair stringers or any material that is to be laid out with the square—especially around factories and railroad yards where smoke and dirt have made the wood nearly black—it will be found that white or red lead pencil will show the marks better. Always sharpen the pencil on one side of the lead to a gradual point as this allows of marking closer to the square or rule. A jack knife is a good tool with which to mark soft wood. One of these knives with a sheep's-foot blade is dandy to mark with. Start the saw slowly until the teeth center the mark.

Use a steel tape measure if possible to obtain the lengths of rafters. It is more accurate than the method of checking along the blade and tongue for the rise and run. If it is not done very carefully, it will result generally in being too long. For instance, a building 20 ft. wide and with quarter-pitch roof calls for 6 and 12 on the square. One foot of length is 13 5/12 or 10 x 13 5/12 = 11 ft. 2 in., so lay off the length on the tape line only using the square to mark the seat and plumb cuts.

Saw manufacturers produce a saw to run in seasoned lumber without "set." Sometimes the user desires a little set in one of these saws and if not extra careful the teeth will break in trying to set it. Try warming the saw over a stove or lay it out doors in the hot sun, when it can be set without breaking the teeth so easily.

HUGE BUILDING TIMBERS

In connection with some building work in progress at Ft. Omaha, Nebraska, are four sticks of timber, each measuring 50 ft. in length by 12 x 18 in. in cross-section and weighing 30,000 lb.



GENERAL VIEW SHOWING RELATIVE POSITION OF THE GARAGE TO THE HOUSE OF THE OWNER

A PRIVATE GARAGE OF HOLLOW TILE

THE CHAUFFEUR'S QUARTERS LOCATED ON THE FIRST FLOOR—THE GYMNASIUM A FEATURE

A PRIVATE garage of the more pretentious type offers excellent opportunities for the combining of the garage and chauffeur's living quarters with some convenience for the owner which cannot easily be placed in the dwelling house itself. The necessarily sturdy construction of a building of this nature admits of such an excellent combination as that of garage and gymnasium, thus giving the owner ample opportunity to indulge at his own convenience in any indoor athletic pastimes for which he may have an inclination. In view of the increasing activity with which business men are devoting themselves to keeping in good physical



COMBINATION GARAGE AND GYMNASIUM AT PELHAM, N. Y.—ARCHITECT, AUGUST SUNDBERG, NEW ROCHELLE, N. Y.

condition this consideration is an important one.

This combination of garage and gymnasium is effected in the building here described. On the second story is placed the gymnasium, which is about 24 x 19 ft. in dimensions. One corner is partitioned off to house a bathroom containing lavatory, bath tub with an overhead shower, and a water closet. At the left, the gymnasium opens upon a porch. In the gymnasium is located a fireplace built of cut brick and provided with a Covert damper and an ash chute.

The garage is, of course, located in the first story, and contains accommodations for two cars. There is also a work bench and ample closet room, as may be seen from an inspection of the plans.

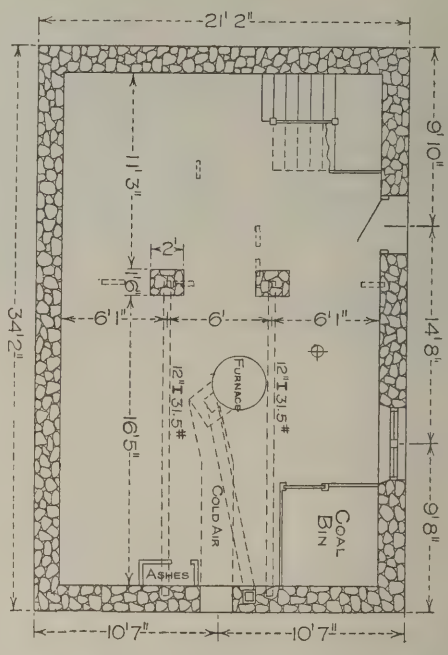
At the left of the car space is located the chauffeur's living quarters, which consist of a bedroom and a bath room. A hall separates these two portions of the living quarters and contains the stairs leading up to the gymnasium and also those which give access to the cellar, which extends under the entire building. This hall, communicating with the car space, permits admission from outside to the gymnasium and chauffeur's living quarters without the necessity of going through the garage itself.

The building is of fireproof construction, the foundation walls being 18 in. thick and built of local stone laid in cement mortar. The outside walls below grade are plastered with cement.

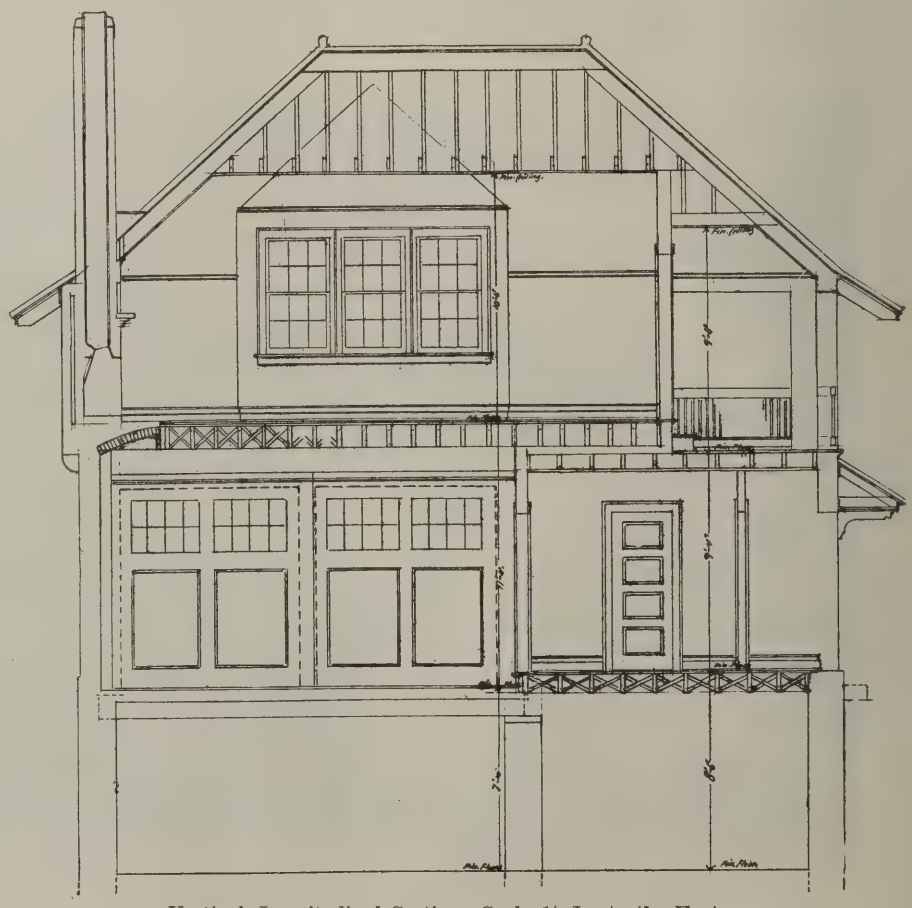
The walls are constructed of "Natco" hollow tile blocks measuring in size 8 x 12 x 12 in. The



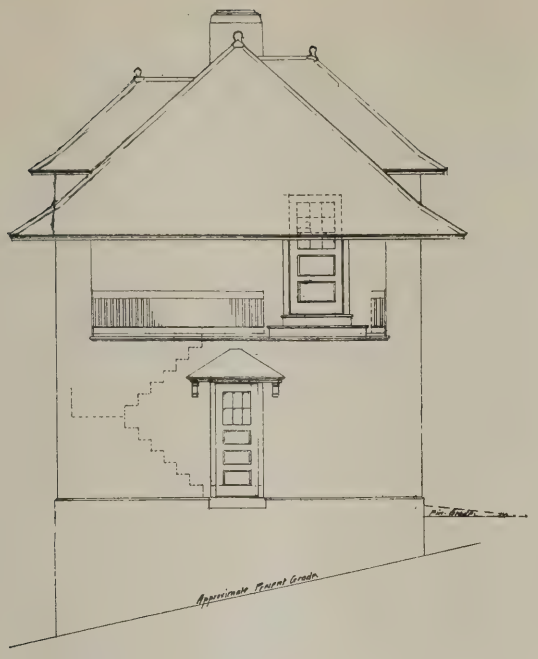
Rear Elevation Showing Entrance to Basement—Scale 3/32 In. to the Foot



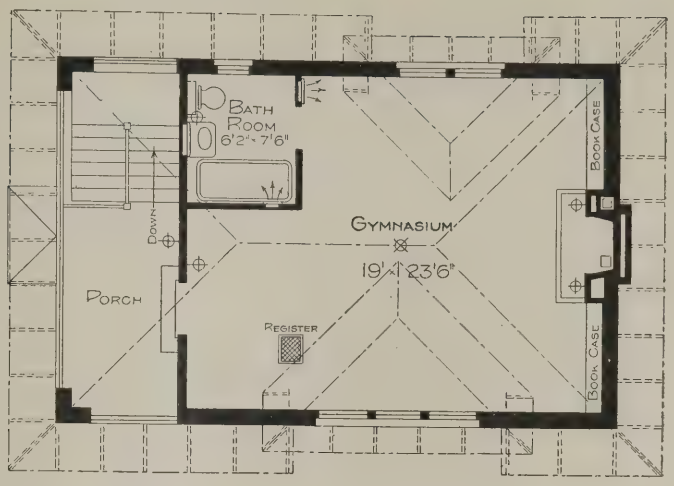
Basement Plan—Scale 3/32 In. to the Foot



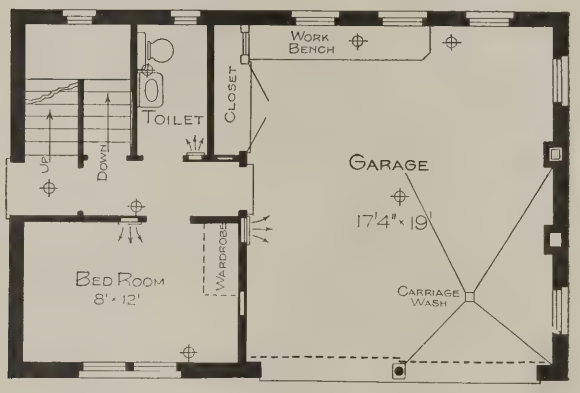
Vertical, Longitudinal Section—Scale 1/8 In. to the Foot



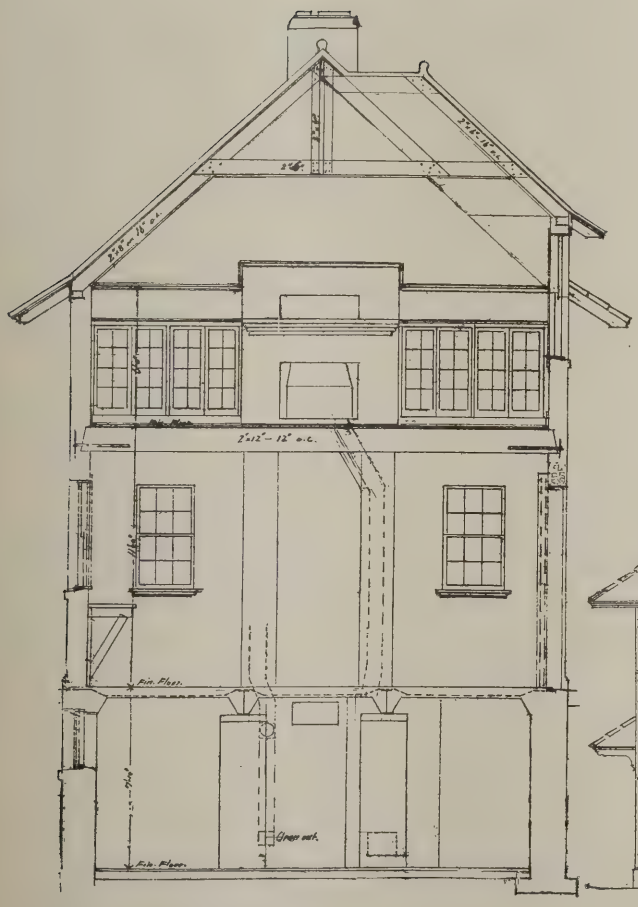
Left Side Elevation—Scale 3/32 In. to the Foot



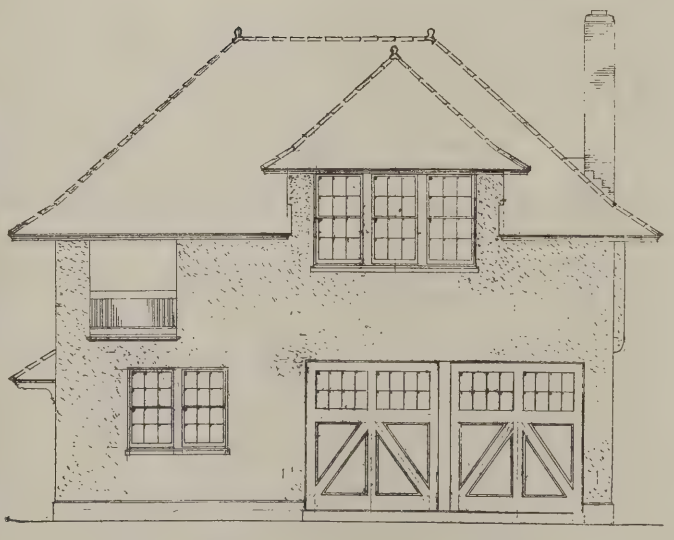
Second Floor Plan with Outline of Roof—Scale 3/32 In. to the Foot



Main Floor Plan—Scale 3/32 In. to the Foot



Vertical Cross-Section—Scale ⅛ In. to the Foot



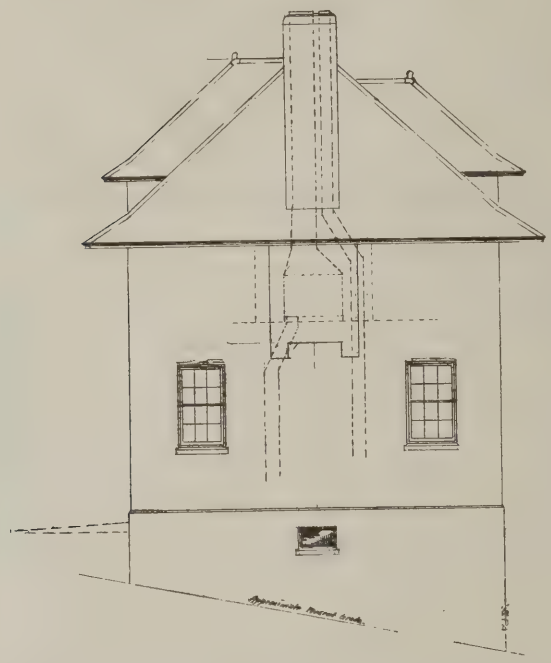
Front Elevation—Scale 3/32 In. to the Foot

PLANS, ELEVATIONS AND SECTION OF PRIVATE GARAGE OF HOLLOW TILE

lintels over openings 3 ft. or less in width are constructed of reinforced Natco Blocks, while lintels of more than 3 ft. span are reinforced concrete girders. Over the exterior of the hollow tile walls was applied rough cast stucco, the proportions being one part of Portland cement to two parts sand.

The roof is covered with Ludowici-Celadon Co.'s Spanish roofing tile, the sheathing boards being laid close together and receiving building paper before the application of the tiles.

The cellar floor is of cement. Two 12-in. I-beams extend under the garage floor, resting on piers after the garage floor is spanned. The garage floor is 4 in. thick and is of reinforced concrete, the mixture being a 1:2:4, and the reinforcement consists of Clinton welded wire, which



RIGHT SIDE ELEVATION OF HOLLOW TILE GARAGE—SCALE 3/32 IN. TO THE FOOT

rests directly upon the I-beams. The floor is pitched to a carriage wash. The garage doors are equipped with Richards-Wilcox hangers.

The doors and trim of the building are of cypress. In plastering, Sackett's plaster board served as a foundation for three coats of plaster, sand finish. The ceilings are of 7/8 x 3½ in. North Carolina Pine beaded ceiling boards.

Electricity is used for lighting purposes. The building is heated by hot air, the furnace being of Richardson & Boynton Co. make.

This combination garage and gymnasium is located at Pelham, N. Y., and was built for Mrs. James L. Gary in accordance with plans and specifications prepared by Architect August Sundberg, 78 North Avenue, New Rochelle, N. Y.

It is said that a nail will hold better when hit several times lightly than if it is driven home by one hard blow.

CONSTRUCTION OF JAPANESE HOUSES

Japanese houses in construction are frail frame affairs. The ever-present danger from earthquakes having to be considered, no mortar, stone or brick enters into the makeup, even underground foundations being dispensed with. The outer enclosing walls are of solid wood, and the windows and partitions are lattice frames covered with opaque paper and all slide in grooves, this permits throwing the entire story into one room.

These "doll houses" make the neatest, daintiest abodes one can imagine, and their simplicity of furnishing appeals to the American housewife as ideal. Rugless floors inlaid with thick straw mats and soft enough to form the foundation of a comfortable bed when supplemented by thick padded quilts, afford one the choice of having his bed made up in any part of the room he may prefer.

No furniture interferes with sweeping, and there is little to dust, since these people do not make their homes museums of art and curios. A small fireproof building is provided conveniently near, known as a "go-down," in which is stored all the surplus family possessions of bric-a-brac, and valuable clothing. Some of the living rooms have a little alcove and shelf, with a vase or a piece of bronze. A scroll hung on the wall, a low stand, and if the weather makes it necessary, a brazier, with a few glowing charcoals, is added to warm the fingers. The best room in the native house is placed in the rear of the dwelling, because it overlooks the garden, and in no other country do dooryards contain so many artistic flowers within so limited a space.

INCORPORATION OF NORTHWEST FACE BRICK ASSOCIATION

The Northwest Face Brick Association, 1955 University Avenue, St. Paul, Minn., has been incorporated by brick dealers for the purpose of promoting the brick industry as a whole, officers being elected as follows:

President.....John T. Harrington of the Twin City Brick Co.
Vice-Pres.....F. H. Merrill of the Belt Line Brick Co.
Sec'y and Treas.....C. A. Gunn.

It is the intention of the association to eliminate all unnecessary expenses in the marketing of products, to keep closer watch on credits, and to work to stimulate the use of face brick as an important building material.

During the past year the Forest Products Laboratory at Madison, maintained by the Forest Service of the United States Department of Agriculture in co-operation with the University of Wisconsin, made 11,600 strength tests on twenty-five species of American timbers. The United States Government now has more thorough and comprehensive data on the mechanical properties of wood than any other nation.

PERMANENCE IN HOUSE CONSTRUCTION

BASEMENT FLOORS AND WALLS OF CONCRETE —THE PORCH FLOORS—BEAMS AND GIRDERS

By ALBERT M. WOLF, C.E.

IT is quite natural to find that the majority of people have been rather slow to accept concrete as a suitable material for residence construction, mainly because it was something new and because they were, as usual, perfectly willing to let some one else do the "experimenting," as they thought it to be.

Concrete seems to have first been employed in the construction of basement or cellar floors, to replace the damp, unsanitary dirt and loose board floors in use at that time. The early concrete floors laid on the ground were made of natural cement concrete, usually of a very lean character, except for the finish, and for this reason, coupled with lack of proper preparation of the subgrade, the results were not always satisfactory.

With the advent of Portland cement came the possibility of better concrete, but the floors constructed were not always what they should have been, by reason of the "skinning" of cement, slabs being made too thin, and yielding of the sub-base owing to lack of tamping of cinder or gravel base or removal of soft spots of earth or both.

To secure a good floor the following method of placing should be used. After excavating the basement to the proper subgrade and removing all soft spots of earth and refilling them with tamped cinders, place over them a layer of cinders 6 in. thick, thoroughly wet down and tamped. The concrete base course, consisting of 4 in. or 5 in. of a 1:3:6 concrete mixture, should be spread on the cinders while they are still wet. After floating this to the proper grades the ¾ in. or 1 in. finish coat of 1:2 mortar should be placed and troweled smooth. If laid in warm weather the floor should be kept wet by sprinkling to prevent too rapid hardening and consequent shrinkage with attendant cracks.

Concrete was next used in the construction of foundations and basement walls, which previously had been built of stone, brick or tile. The main trouble with the early concrete walls was that they were as a general rule too thin and that no reinforcing was used in them to resist the forces of expansion and contraction due to temperature changes and of shrinkage of the material when setting. As a consequence unsightly cracks appeared after a time, which, although they seldom seriously weakened the wall, made them difficult to waterproof, and were unpleasing to the eye.

To correct these defects good practice now dictates that steel to the amount of 0.25 to 0.3 of 1 per cent. of the section directly exposed to temperature changes should be placed in the top of the wall, whether or not any other reinforcement is required. Then also experience has shown that reinforcement should be provided at corners, openings, and other places where decided changes in section occur. The cost of reinforcing steel required to render an ordinary residence basement wall proof against unsightly temperature and shrinkage cracks is such a small percentage of the cost of the work that it is poor economy to omit it. Neither does it pay to make such walls too thin. A wall 6 in. thick may do the work of carrying the load coming upon it, but if ground water is encountered the saving may be dissipated in trying to waterproof the wall, which, if it had been 9 in. or 12 in. thick, would have allowed more careful placing of the concrete and perhaps no waterproofing would have been necessary. Experience teaches that basement walls much under 12 in. thick are of doubtful economy.

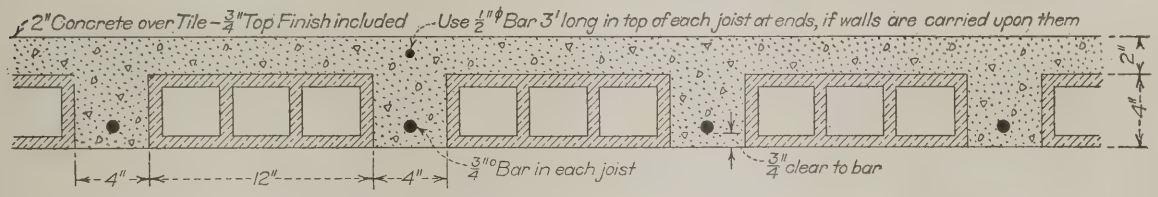


FIG. 1—CROSS SECTION OF CONCRETE AND TILE PORCH FLOOR OF 9-FT. SPAN

While concrete is used in the great majority of cases for the construction of basement walls and floors, a very relatively small percentage of houses are built with monolithic concrete walls above grade. This no doubt is due to the fact that improper architectural treatment of many concrete houses has made them rather unpopular as a class. This does not mean, however, that monolithic concrete houses of pleasing design have not or cannot be built, for the reverse is true.

Fortunately, however, concrete building blocks of good quality are now obtainable and extensively used. These are made by what is commonly known as the wet process; that is the concrete is mixed rather wet as contrasted with the method of

making the porous concrete blocks which were so common a few years ago. The blocks are then molded under pressure, thus insuring a dense block which with proper precautions can be made waterproof and moisture resisting. It seems advisable, however, especially in this locality, to fur out such walls before plastering unless they are arranged as a double wall with an air space between.

Monolithic concrete and block walls are excellent fire-retardants and are what can be termed permanent, if properly built. First class block walls can be built at less than the cost of brick or clay tile walls stuccoed, which last mentioned types are used quite extensively and with excellent results.

If a modern home is otherwise of permanent and fireproof construction the partitions should also possess the same quality, so as to act as fire stops or retardants. Solid plaster partitions on metal lath

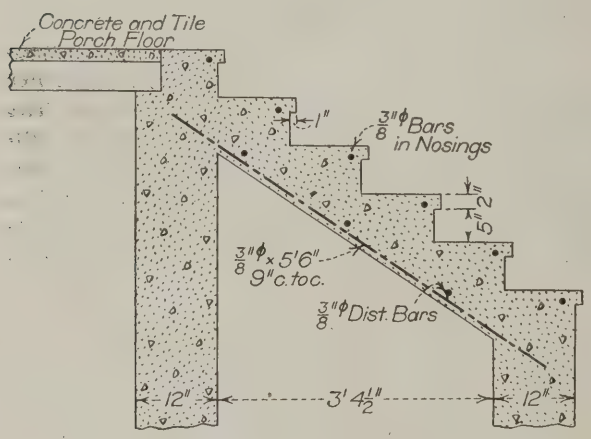


FIG. 2—SECTION OF CONCRETE PORCH STEPS

and gypsum and clay tile partition blocks give excellent service in residence work.

Usually the first place in a house to show the ravages of nature is the porch as ordinarily constructed of wood, owing to the severe condition of alternate wettings and drying out to which it is subjected. This means that the maintenance cost is high or that renewals must be made at frequent intervals if frequent painting is not done.

On the other hand, a concrete porch floor is fireproof, sanitary, permanent, and hence devoid of maintenance charges. The slight additional first cost of a concrete porch floor is only from 10 to 15 per cent more than wood.

For what is ordinarily termed a 10 ft. porch, that is 10 ft. from wall of building to outer edge of porch or about 9 ft. clear span, a 4½ in. concrete slab will suffice. Such a slab reinforced with ½ in. diameter bars transversely spaced at 6 in. centers and ½ in. diameter bars 18 in. centers longitudinally to act as distributing bars will carry a live load of 60 lb. per sq. ft. with the ordinary factor of safety used in design. If the walls support the slab so that the ends of slab are partially fixed the transverse bars should be bent up at alternate ends at about 18 in. from the supports so as to provide reinforcement to care for the negative moments developed.

MAKING A LIGHTER FLOOR

A somewhat lighter floor can be obtained by the use of the so-called tile and concrete joist construction wherein 12 x 12 in. clay tile are laid in rows 16 in. on centers extending from support to support and the space thus formed (4 in. wide) between the rows of tile is filled with concrete and a covering of about 2 in. thick placed over the tile to form the floor surface. The clay tile simply act as filler blocks and the concrete joists and slab act as a series of T-beams. For the span mentioned above, 4 in. tile 16 in. centers with a 2 in. top coating and each joist reinforced with a ¾ in. dia. bar will suffice. This construction shown in Fig. 1 is considerably lighter than the solid slab, the concrete averaging only 3 in. thick, as against 4½ in. for the solid slab.

In both designs the top ¾ in. of the slab should be composed of a 1:2 cement mortar troweled smooth to form the wearing surface. Unless this is placed before the concrete in the base has taken its initial set the rough slab should be made of the thickness given and the finish added thereto at some later time. In such event a light wire mesh should be lightly bedded in the top of the rough slab so as to stick up here and there; then after cleaning and soaking the concrete (at the time the finish is to be placed) a good bond will be obtained between the concrete previously placed and the finish and the mesh will prevent the latter from cracking, due to shrinkage or expansion and contraction caused by temperature changes. If a colored floor surface is desired a coloring matter or a colored hardener can be mixed with the mortar.

Interior floors can be constructed in a similar manner, but the concrete sections and the reinforcement must be increased if the spans are greater than those given. Ordinarily such floors will in reality be rough subfloors upon which will be placed a wood floor laid on sleepers bedded in cinder concrete, quarry tile, cork tile, linoleum or some similar wearing surface.

OUSTIDE BASEMENT STAIRS

The same arugments advanced for the use of concrete porch floors hold good for concrete steps and stairs in exposed and sheltered places. Outside basement stairs are in general installed under conditions especially favorable to the formation of rot and decay of wood. A concrete stair eliminates this and the danger of painful accidents occurring with the collapse of decayed wood stairs when in use.

For ordinary porch steps an inclined slab 5 in. or 6 in. thick, supported by walls at both ends and with the risers cast integral therewith, will be adequate to carry the loads coming upon it. Such steps are sometimes built of plain concrete on a fill heaped up between the walls, but this can hardly be called good practice, since the fill is almost always sure to shrink (unless composed of sand) and the stair slab thus left without support will crack and settle. The safer, and in the end the more economical, method of

construction is to reinforce the inclined slab between upper and lower supports so as to carry the loads imposed without reliance upon the support of the earth underneath. For a stair containing six or seven risers a 5 in. inclined slab reinforced with ⅜ in. dia. bars 9 in. on centers placed in the bottom of the slab from upper to lower support will be ample. Distributing bars of the same size should be placed above these bars at right angles thereto at about 18 in. centers. It is also advisable to place a small sized bar in the nosing (if not of metal) of each step to prevent shrinkage and contraction cracks all as shown in Fig. 2. The appearance of the steps can be materially increased by placing a projecting metal nosing on each tread or forming one of concrete as shown in the sketch. If the steps are frequently used a narrow safety tread flush with the top of the concrete at the front of the tread will give added safety against slipping.

Basement stairs should be built in much the same manner as shown in Fig. 2, but since such stairs are naturally of a utilitarian rather than artistic character, the same results, as far as comfort to the user is concerned, can be obtained by cutting back the riser, on a gradual slope, to form the nosing as shown in Fig. 3.

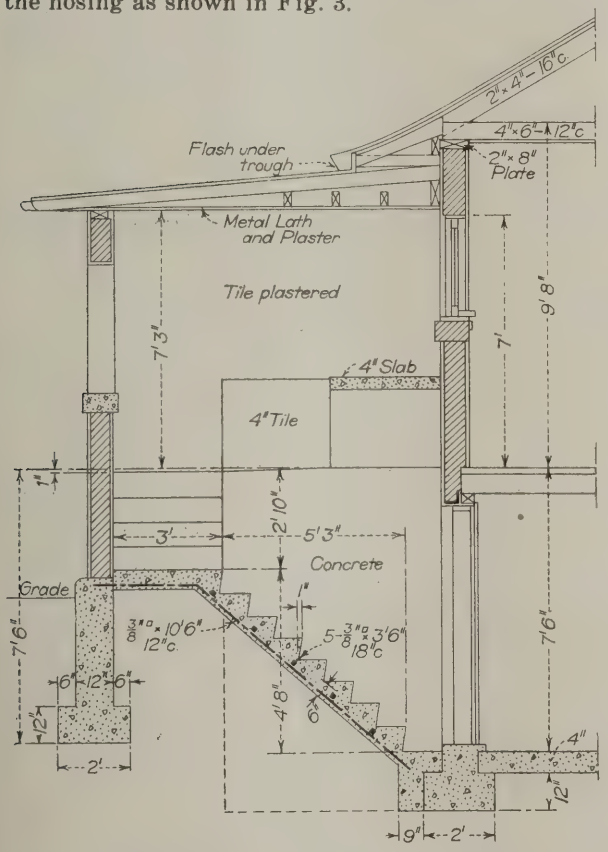


FIG. 3—VERTICAL SECTION THROUGH CONCRETE BASEMENT STAIRS

Concrete beams and girders can be very advantageously employed as lintels, in spanning comparatively long openings as in porch construction or for supporting fireproof or wooden floors. For such work the designer will, in the writer's opinion, find it best to choose generous concrete sections and thereby avoid complicated reinforcement to care for web stresses which the concrete cannot safely resist alone. The use of such reinforcement may be sanctioned on large work, but on small jobs such as

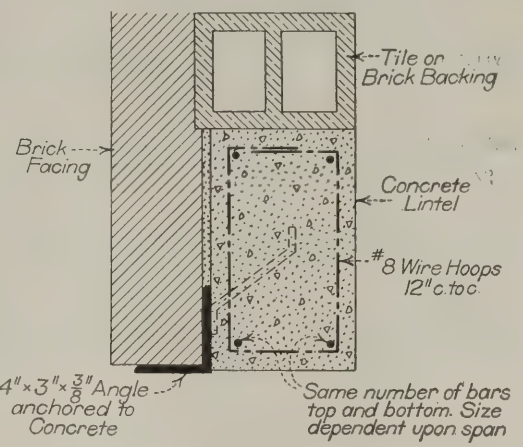


FIG. 4—DETAIL OF A REINFORCED CONCRETE LINTEL

dwelling houses it is not. Except for short lintels it is not advisable to use concrete beams having a thickness of less than 8 in.

Long span beams can most economically be poured in place while window and door lintels (in brick and tile walls) can be made more cheaply by casting in units on the ground and hoisting into place after curing, owing to their compartive lightness. Where the exterior finish is of brick a 4 in. x 3 in. x 5/16 in. steel angle anchored to the side of the concrete lintel at the bottom will support the veneer of brick as in Fig. 4, and where the finish is stucco on clay tile the lintel should be faced with furring tile, placed in the mold before the concrete, so as to give the same surface for stucco finish at all points. If concrete tile are used as a base for the stucco no facing of lintels will be necessary, but they should have the surface to receive stucco roughened or grooved to furnish a key for it.

The advantage of concrete lintels over those of steel and cast iron is that they are fireproof and will not buckle or collapse like the latter when subjected to flames during fires, which are usually concentrated or hottest at window and door openings.

NEW TYPE OF PREHISTORIC BUILDING

A new type of prehistoric building—the pueblo constructed in the open and unattached to cliffs—has been discovered in the Mesa Verde National Park in Colorado by Dr. J. Walter Fewkes of the Smithsonian Institution. In announcing the discovery the Institution estimated that the specimen unearthed, resembling in most particulars the terraced community building of the cliff dwellers, may date back six centuries.

The pueblo is in the Mummy Lake group and Dr. Fewkes believes there are many scores of similar structures nearby. It contains forty domicilary rooms and four circular, ceremonial kivas on the two floors resurrected, and there are evidences that originally a third story topped the structure.

BUILDING AGE

(Founded in 1879 by David Williams)

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SUBSCRIPTION RENEWALS

When subscriptions are renewed, credit will be given the subscriber on our books. If any receipt is desired, kindly let us know.

Index to reading matter will be found on page 17 of the advertising section.

MAY, 1917

CHANGE OF ADDRESS

We desire to call the attention of our readers to the fact that the BUILDING AGE has moved into new and more commodious quarters at

243 West 39th Street, New York City,

and all correspondence for both editorial and advertising departments should be addressed accordingly.

THE ENTERPRISING ROOFER

The development of the roofing industry, in the building trades, occupies fifty firms in Detroit, Mich., who have had the enterprise to bring their business to the attention of the general public through the presentation of articles in the daily papers. The roofer has taken the building permits and made them apply specifically to his branch of trade and has improved the opportunity to call attention to the protection which the proper roof affords to a property. It is clearly stated that none surpass the fire resisting roof, which when constructed of the proper materials provides a covering requiring the minimum amount of attention. The roofer who feels that when a man needs a roof he will go to a man in the roofing business is about as far behind the attainment of success as the grocer who, having a store on the corner, does not feel it is necessary to canvass the houses in his community for their orders or to deliver the goods to them. The trade of the roofer may be stimulated the same as the trade of a department store by good advertising and by that character of publicity and acquaintance which is derived from mingling among the people. People are interested in bulletins and the window of the roofer's shop or office may well be used not only for the display of roofing materials, but for the presentation of bulletins about the changes in prices, the safety of a given building in the midst of a fire due to its roof and similar things. This is the season when plans for the erection of contemplated buildings are being executed, and the roofer who has not made his name conspicuous in his trade has neglected an opportunity to make a favorable impression.

FIRES AND THE COST OF LIVING

A work that is not always appreciated is being conducted by the National Board of Fire Underwriters in directing people to the enormous loss due to fires in the United States as compared with fires in other countries. Many of the American fires could be prevented if proper precautions were taken. To cite the effect of fires on the cost of living, the statement is made that a recent blaze in an Illinois elevator rendered 700,000 bushels of corn unfit for human food and destroyed 300,000 bushels of oats. Individual barn fires add enormously to the total, to say nothing of the live stock which is also lost. The supply of wood which is required to make up for these losses in New York State alone employs 200,000 people, with an annual product of nearly $400,000,000. Then there is also the enormous loss through forest fires. Probably no class of men is more interested in fire prevention than the practical builder, and no service he can render to the public will be more beneficial than to continually keep before it the advantages of fire-resisting construction, whether it be in connection with private dwellings or business buildings which he may be called upon to erect.

THE DISTRICT HEATING SYSTEM

Frequently those who own or occupy residences or buildings of other kinds located along the line of district-heating systems are urged to abandon their individual heating plants and connect with the street supply. A recent experience in Lafayette, Ind., shows that there is advantage in each building

having its individual heating plant so that it can be relied on in case of need. With the outdoor temperature below zero, the district-heating plant broke down and the supply of heat was cut off from many business houses and homes. This led to a scurrying about for gas and oil stoves and much suffering was endured before the temporary heating apparatus could be put in operation. In some instances where persons who desire to get rid of the annoyance of handling coal, removing the ashes and the care of the fire have been induced to become customers of the district-heating system, they have insisted that their own heating apparatus shall be connected into the main from the district-heating system, when in just such cases by an adjustment of the valve the home individual heating plant can be fired up and no disadvantage experienced. There is a suggestion that the enterprising heating contractor may impress upon those who are erecting buildings the desirability of having an individual heating plant in case of need. Possibly the saving in labor and annoyance through the use of the district system would, in a few years, amount to the cost of the individual plant which would be ready in such an emergency as was experienced in Lafayette.

RECENT TENDENCIES IN INDUSTRIAL BUILDING CONSTRUCTION

The present trend of industrial building construction is indicated by a recent investigation made by President W. P. Anderson of the Ferro Concrete Construction Co., Cincinnati, and presented in a paper read before the recent annual meeting of the American Concrete Institute in Chicago. The results of Mr. Anderson's investigation were drawn from inquiries made of the leading industries, manufacturers of all classes of metal goods, brewers, makers of textiles, paper, leather, boots and shoes.

Of the representative manufacturers who were requested to furnish data 370 concerns contributed information covering 1230 buildings erected during the period covered by the investigation. These varied greatly in size, use and construction, but all were used for industrial purposes.

The returns, year by year, are graphically represented in a chart accompanying the paper and covering the four major classifications—all wood, brick walls (steel frame), mill construction, concrete construction. Of course, the abnormal disturbances during 1914-16 account for the great fluctuations in that period. But even up to and including 1913, the advance of concrete construction and the relative decadence of other types are distinctly noticeable. The comparative growth of the various types of building construction is most strikingly shown by comparing the periods 1905-10 and 1911-16. In the former, the returns cover 7,014,218 sq. ft. of mill construction and only 5,512,579 sq. ft. of concrete construction, but in the later period the area of concrete construction jumped 327 per cent, to 16,926,152 sq. ft., while the mill construction showed a bare increase of about 10 per cent, to 7,709,469 sq. ft. The estimated area for 1916 was used in making up the comparisons.

FIRE-PROOF WAREHOUSE FOR LOS ANGELES

The California Corporation Commission has issued an authorization to the Panama-Pacific Warehouse Corporation of Los Angeles permitting it to create a bonded indebtedness of $450,000 on a paid up capitalization of $350,000; and it is announced that the company will now proceed with the erection of a five-story fireproof warehouse on its site in Los Angeles. The building, exclusive of the site, is to cost approximately $350,000 and the equipment about $82,000. The building will have a total floor space of 350,000 square feet.

BUSINESS BUILDING OF UNUSUAL ARCHITECTURE

A rather interesting example of remodeled building construction will be that of the property at the northwest corner of Madison Avenue and Fifty-fifth Street, New York City. The structure will be devoted to those engaged in interior decoration, furnishings and kindred arts, and will be remodeled along the French-Gothic lines of the English church of St. Germaine in Paris in accordance with plans by Architect Benjamin W. Leviton. The roof will have an Italian garden as a picturesque setting for marbles and statuary.

On the first floor will be exhibited English examples of the Georgian periods; on the second Jacobean periods; the third will be devoted to French rarities and the fourth to Italian. On the fifth floor will be a gallery for tapestries and rare paintings.

The Department of Labor of the State of New York has issued Bulletin No. 81 covering court decisions on the Workmen's Compensation Law from July, 1914 to August, 1916.

Of the English women who have recently been instructed in carpentry at Byfleet, England, twenty are now said to be in France helping in the erection of huts for the soldiers. French and Belgian women are also engaged in work of this sort.

The plaster used by the ancients was at first merely a mixture of mud and water. Later the advantage of burnt limestone was discovered and lime has been an ingredient of all plaster ever since.

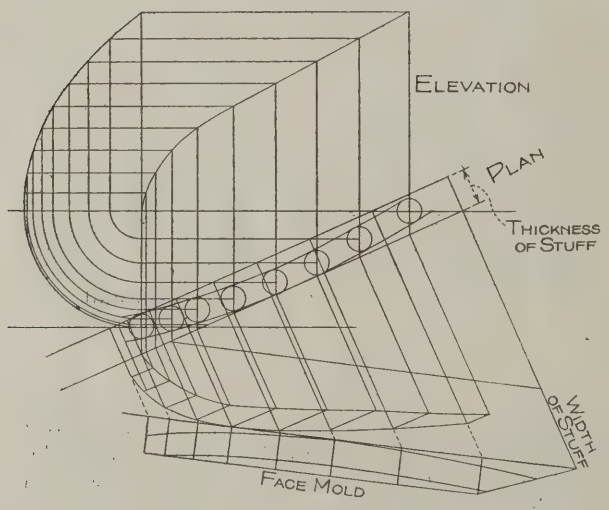
CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION

From James Bruce, Wanganui, New Zealand.—I have just received my first copy of the BUILDING AGE, it being the January number, and as I noticed correspondence is invited I would like, if not too late in the day, to criticise the valleys for greenhouse construction by "C. J. M." of St. Johns, Newfoundland. Although I have never met this particular case I have had some experience with this class of valley, namely, the valley between a bullnose roof on a gable roof in a veranda and the curve in plan was so great that it has to be done in two pieces. This class of work here is always done by the handrail hand.

As far as "C. J. M." has gone our methods are alike, but he seems to think or at least I so understand him that one could cut out the rib to the shape of the upper edge and shape to the curve of plan after having thus cut it. I am sure it could be so done, but it would not prove a very practical way for this reason: "C. J. M." appears to have overlooked the backing of the valley—a thing that must be taken into account. As it is the outside edges that really fit the roof, the center will very probably be in the shape of a box gutter and as long as it is deep enough and has a fair run the center does not count.



GETTING OUT CURVED VALLEYS FOR GREENHOUSE CONSTRUCTION

I should say the valleys should be at least 3 in. thick—1½ in. for the box part and ¾ in. on each side as flanks; at least that was what I used and it gave satisfactory results.

Take a straight valley, for between two different pitches with the center of the rib on the line of intersection of the roofs, the edge under the steepest pitch will be a great deal higher than the edge under the flatter roof. The same reason applies to the curved roofs of different pitches only in a greater degree and the falling line on one side will be different from the falling line on the other. Therefore, I think to cut it to a vertical shape first and then to fit the plan is not so practical as to cut to fit the plan first as one would do for a solid wreath stair stringer as is often used in ship work and then to a falling mold for the top edges the bottom can be cut to a curve that will look nice and square to the sides of the wreath and it will be wider on the high pitch side than on the low pitch side.

The nearer the curves of the roofs are similar, the nearer the sides of the rib will be to a vertical plane.

I am sending a diagram of method of lines I would use to do the job in one place. It might have to be done in two or three pieces, but the principle is the same. First get an elevation of the ribs; cut them with horizontal planes, which will cut the roof in straight lines—if the plan of the building is straight; then find the plan of these lines and from their intersection set off on each side of them half the thickness of the rib. Pass a curve through these points and it will give the plan of the valley.

Draw two parallel lines, which will just inclose the plan. This will be the thickness of stuff required from which to get out the rib. From the points where the horizontal lines cut these sides erect perpendiculars of the height of each horizontal plane and pass a curve through these points. These curves will be the elevation of the edge of rib on the plane of the stuff. Take the depth of the rib below the low pitch edge and draw a line, also draw a line parallel to this tangent to the high pitch edge. This will be the width of the stuff required for the rib.

The face mold is obtained by producing the projectors of the steep side (in this case) to cut the top edge of stuff square across and set out the offsets taken on these ordinates in plan. Draw curves through this which will give the mold to back and belly the rib. When this is done apply

the falling mold to each side and work out center to suit the section decided upon.

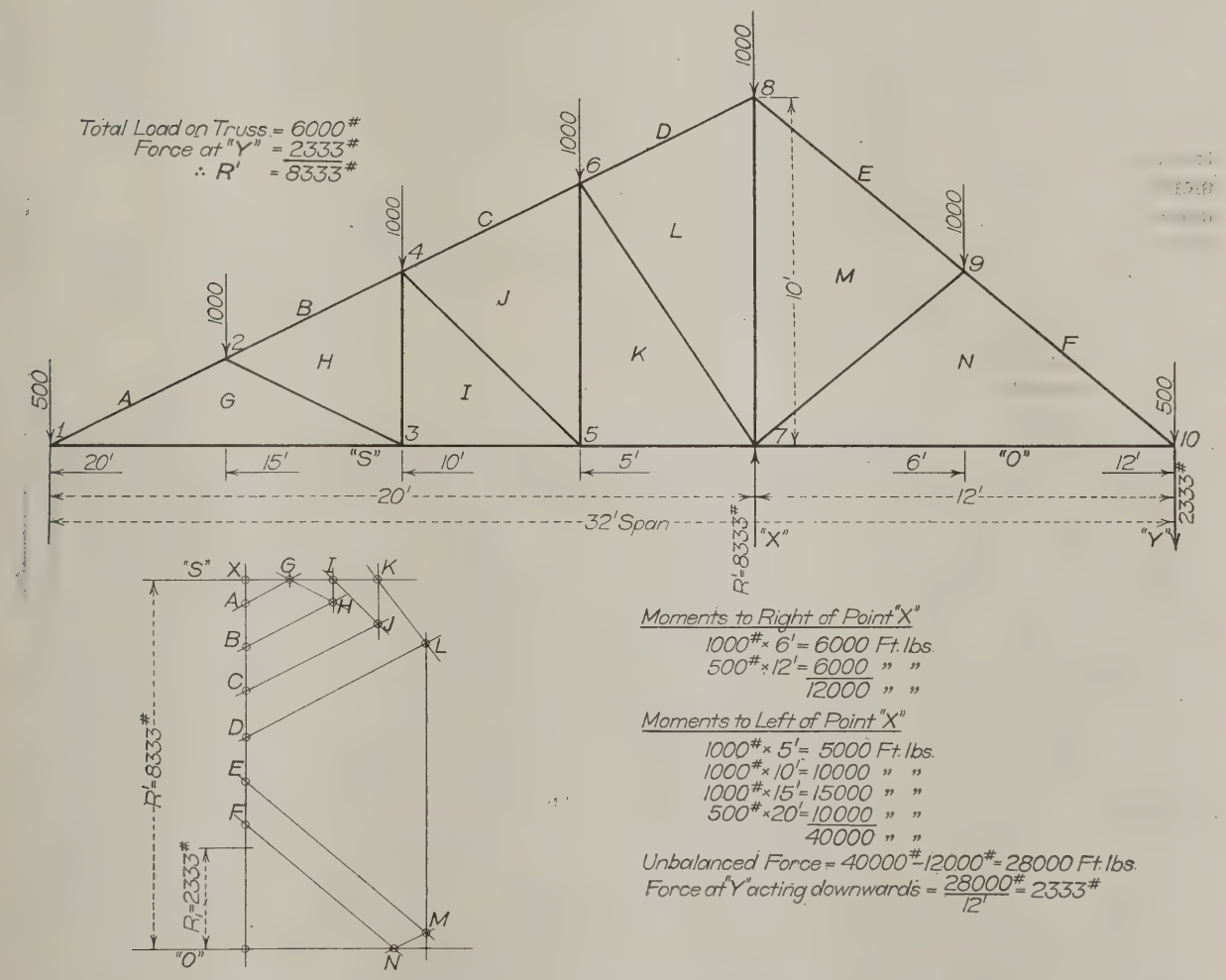
I have not drawn the falling mold, but it is obtained from where the horizontals cut the plan. Find the stretchout and proceed as I have done in finding the width of the piece. The falling mold can be dispensed with by putting the lines directly on to the stuff and if the job was a good-sized piece, that is what I would recommend.

STRESS DIAGRAM FOR CANTILEVER TRUSS

From C. E. O., Maisonneuve, Quebec, Can.—I have been very much interested in Mr. McCullough's stress diagram of cantilever truss which appeared on page 155 of the March issue of the Building Age, being a reply to a correspondent signing himself "Builder." I have followed his method throughout which seems to be very clearly set forth except for a couple of points which I have noted on the enclosed sketches.

In making a careful study of this truss, I see where another problem might crop up, that is moving the point of support from under J-K to a point under L-M. I am inclosing a sketch of a stress diagram for just such a case and would like Mr. McCullough to tell if I have the correct solution.

Note.—In commenting on the above Ernest McCullough says: The roof truss is one that has seen considerable service in examinations for architects' licenses. Sometimes it is supported at the two ends with wind from the right and sometimes it is shown with the wind from the left. Sometimes one end is on rollers; sometimes one end is on plates and sometimes both ends are bolted to the supports. When it appears as a cantilever truss the support may be at joint 3, joint 5 or joint 7. Sometimes a wind diagram must be drawn when it appears as a cantilever truss and sometimes the wind is neglected, or is included in the total horizonal load per square foot and is considered then as acting vertically. It is considered to be a good example because the frame is simple and it shows what the candidate knows about roofs with unequal reactions. Mr. Osler has solved it as I would have solved it for the condition he presents.



STRESS DIAGRAM FOR CANTILEVER TRUSS WITH COMPILATIONS BY MR. McCULLOUGH

with a bolt fully capable of developing that amount of pull. Cantilever trusses cause trouble on account of the uncertainty regarding the load in the force diagram. One end reaction is often so very small that it makes little difference in the stresses in the members. Sometimes, however, a truss may have a large number of panels and the smaller reaction may be fairly large so that some of the members cross the load line and others may be entirely on the left side of the load line. The student should feel no fear about following his lines in the logical order to make the figures close. Stresses on the left side of the load line are merely reversed from what they would be if on the right side of the line. Left and right refer to the hand nearest the side mentioned.

A BUILDER'S VIEW OF THE LAW LICENSING ARCHITECTS

From W. K., Highland Park, Ill.—Replying to the correspondent "J. H." of Chicago, who comments in the April issue of the BUILDING AGE upon the Architects' License Law of the State of Illinois, I am disposed to think that he must have had a very unpleasant experience to offer such a severe criticism of architects in general. The planning and supervision of a building, both from the artistic and the structural points of view, require a degree of study which but few carpenters are willing to give and it is an exceptional man indeed who can get out working drawings with all dimensions figured and never make a mistake.

If "J. H." will read Sec. 9 of the state law, he will find that it does not prevent one drawing plans for buildings to be erected by himself or employees. Also if he will get a little more information on the Municipal laws he will find that they merely require a sufficient and proper plan before a building permit will be issued.

I can see no restriction of freedom in this for anyone who can do the work properly, and when we get a law providing for the examination and licensing of contractors we will have taken another big step toward better building.

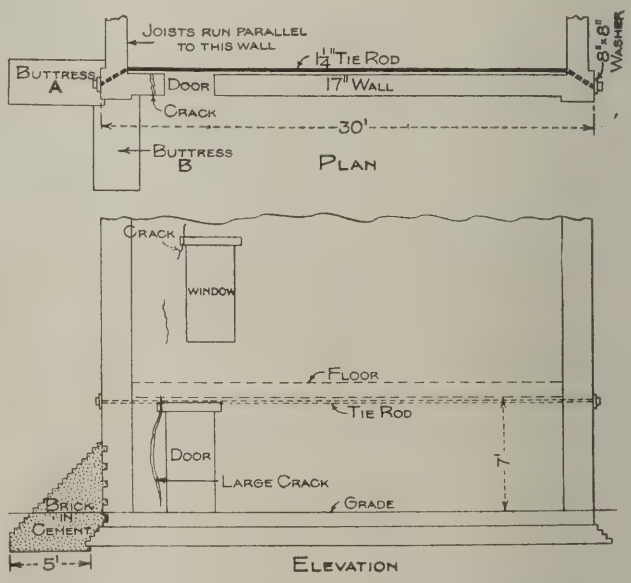
FILTERING RAIN WATER

From A. W., Williamsville, N. Y.—We have an 80-barrel cistern which we use for filtering rain water for washing. At times the water is very black and if a pailful is allowed to evaporate it leaves a black, greasy scum on the sides of the pail. The nature of the cistern is such that I cannot put a filtering cistern on top and about the only thing I can do is to install the largest tank which would be about 10 ft. long, 30 in. wide and 24 in. deep. I can put the tank in the cellar and the filtering materials will not freeze. I can run a pipe from the bottom of the tank to the cistern.

Now, what I would like to have the readers of the Correspondence Department tell me is what material or device can I use to take out the stuff that makes the water black. For the first strainer I could use either felt or a blanket. I might, of course, use bone charcoal, of which there are two grades. No. 1 is fine and No. 2 is quite coarse. Which would be the better for the purpose? I might also use sand and gravel, but I do not care to do this as I might not get the thing right.

REPAIRING CRACKED WALLS OF A BUILDING

From South West, Beaumont, Tex.—I am inclosing sketches and description of a problem that has been turned over to me to solve. I would greatly appreciate it if some of the practical readers would tell just how they would go about making the necessary repairs. The building was erected about eight years ago and until the last three or four months has had the appearance of being perfect in every way. The cracks as shown on the lower part of the sketch appeared about four months ago and I am at a loss to understand why. The large crack near the door has an opening on the outside face of the wall of 1½ in., while on the inside it is only a small one. The bottom of the trench seems to be good hard clay and the foundation was laid up of brick, in cement mortar. The other corners are sound.

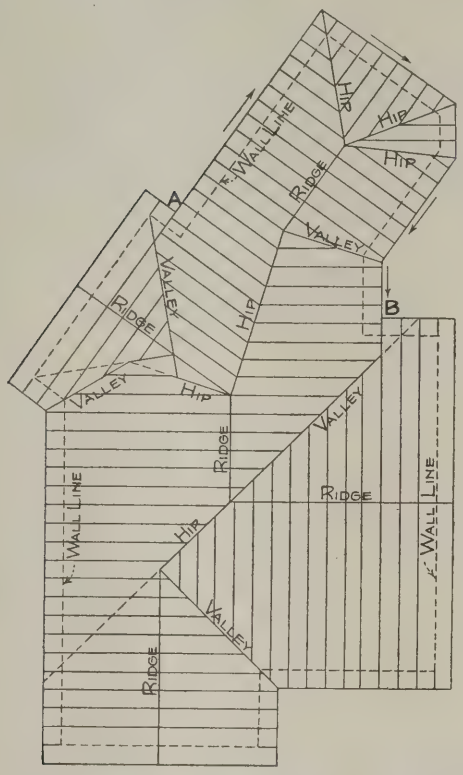


REPAIRING CRACKED WALLS—SKETCHES SUBMITTED BY "SOUTH WEST"

I am making repairs as indicated on the sketch. Buttress "A" extends above the grade, as shown in the elevation, while buttress "B" was extended only to the grade line. A 1¼-in. tie rod was inserted as shown. I would like to know if what I am doing will hold, and, if not, is there any other means which can be employed in connection with what I am doing?

DIFFICULT PROBLEM IN ROOF FRAMING

From R. M. Van Gaasbeek, Pratt Institute, Brooklyn, N. Y.—Herewith find plan of roof as worked out by our Carpentry and Building Class in answer to problem presented by "C. J. M." We have kept equal pitch 9 in. to 12 in. all over the roof. There may be some objection to the sloping ridge, but in designing it strength was the feature most desired and seemed to outweigh this criticism. The plate from A around to B is 3 ft. higher than the remaining portion of the plate.



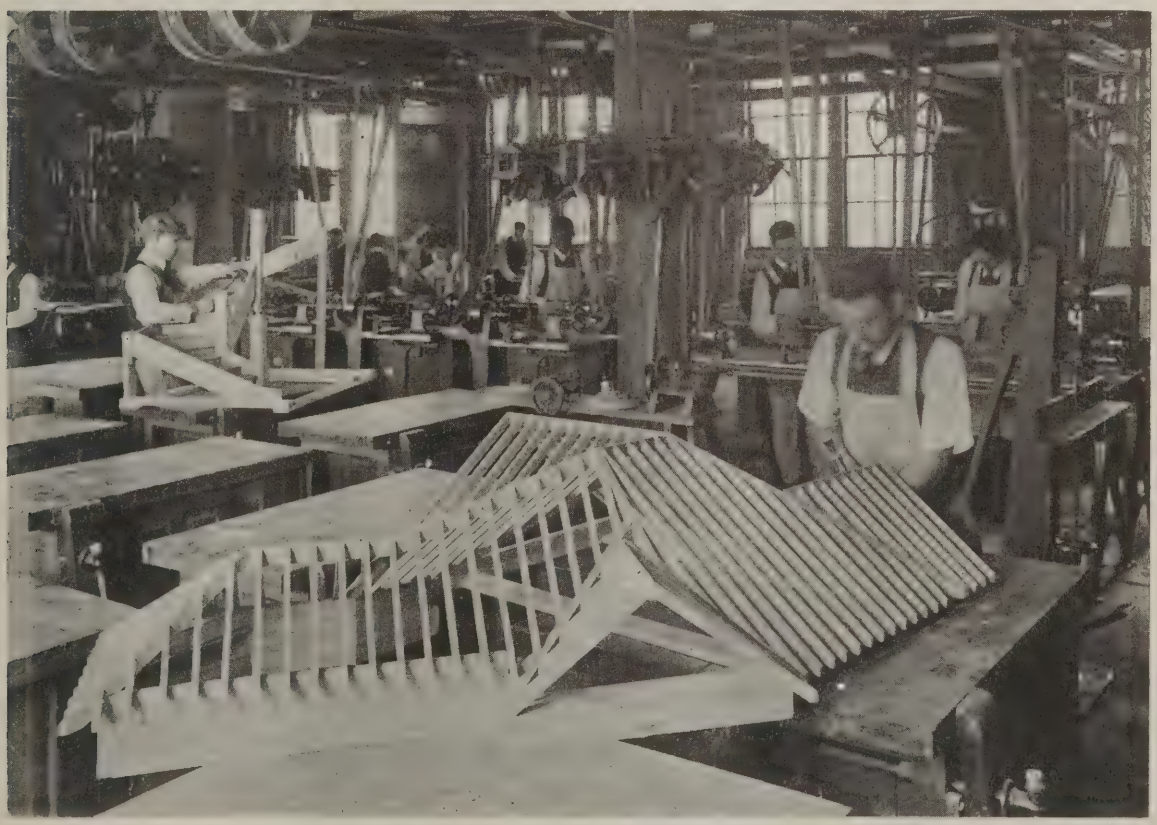
Plan of Roof Framing Submitted by R. M. Van Gaasbeek

I am also sending a photograph of a model of this roof as framed by the students. The picture also affords an excellent view of the workshop.

From W. S. W., Hillsboro, Ohio.—In the February issue I noticed the roof framing problem which "C. J. M." presented for the readers to solve. He says he would like to see it worked out both in plan and elevation. All rafters are to be the same pitch, that is, 10 in. rise to 1 foot run.

All the rafters in the roof here shown are of this pitch except the section of the plan marked "D," which has a rise of about 7⅞ in. to the foot run. I do not see how it could be otherwise. It will be seen from the elevations here presented that I have taken the end next to me for the front which I assume is correct. I have marked all the ridges, hips and valleys in heavy lines, while the common rafters appear in light lines.

The roof comes together all over except under the portion marked "A." In the rear elevation it will be seen there are two rafters here, one under the other and siding between them. The lower end of the hip above it is marked B which, I think, should run clear through to the plate: "C" is a rafter run through the roof for the opposite valley to rest against. I think this roof would support itself except at "A." There should be studding at

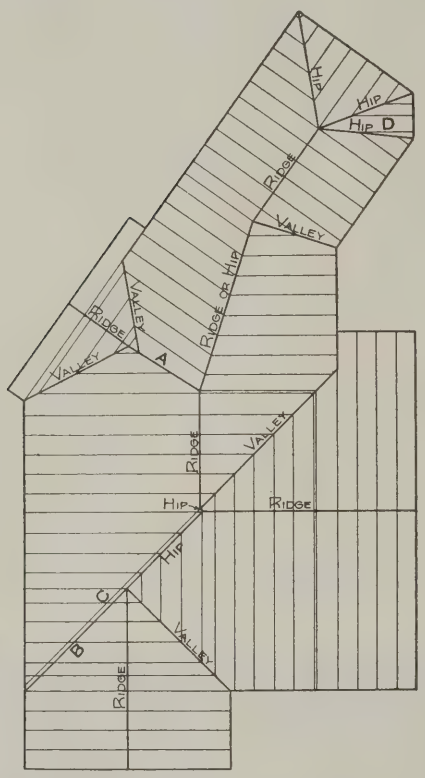


Model of the Roof Framing as Made by the Class in Carpentry at Pratt Institute

this point to support the roof and to which to nail the siding.

I would like to see how some of the other readers work out this problem and after we have all had a show at it I trust "C. J. M." will tell us how he built the roof.

From O. K. Snyder, Instructor in Drafting, Hampton Institute, Va.—I am sending a blue print of roof framing in reply to the problem submitted by "C. J. M.," St. Johns, Newfoundland, in the February issue of the paper. I am also sending a photograph of the model which may be of interest in this connection.



Roof Plan Contributed by "W. S. W."

The lengths and bevels for all hip, valley, jack and common rafters have been worked out by a student in the carpentry class in this Institute, using only the steel square and pencil. The drawing was inked in the drafting room where the student spends seven hours a week as part of his trade work. When the drawing was completed he cut all plates, rafters and ridges necessary to build a model of the roof according to the drawing. The only tools used in assembling were a hammer and steel square, the use of other tools not being permitted, so no fitting could be done at this time. The photograph shows the model after it was completed.

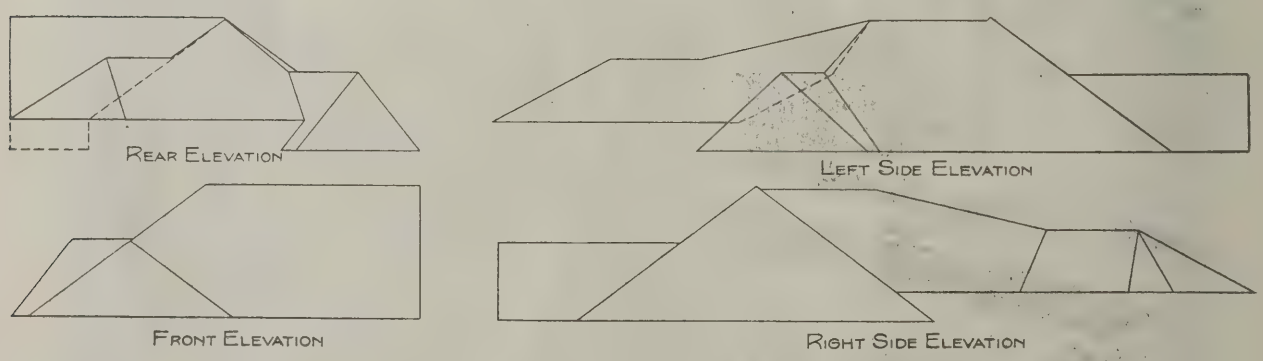
In the plan submitted in the April issue by "D. D.," Edmonton, Alberta, I think he made a mistake by running his hip from the deck to the valley. It should run to the ridge where the valley starts. If "D. D." has some method of framing a hip at that place I should be very glad to see it illustrated in the columns of the Correspondence Department.

QUESTION IN CORNER POST CONSTRUCTION

From Sextus, East Orange, N. J.—Will some of the readers give their experience as to the best method to be employed in building an additional story on to a one-story frame structure? How should the new corner posts be secured to the existing building?

BUILT-IN KITCHEN CABINETS

From A. W., Chicago, Ill.—Have any of the carpenters and cabinet makers who are readers of the BUILDING AGE had occasion to build any cabinets in the kitchens of houses in course of erection or afterward, and if so will they describe the way they executed the work? It seems to me that an expression of opinion regarding this feature of house equipment would prove interesting to readers of the paper in whatever part of the country they might be located.



Various Elevations for the Roof Plan Shown Above, Submitted by "W. S. W."

CONSTRUCTING A BLUE PRINT FRAME

From O. K. S., Hampton, Va.—Will some of the readers of THE BUILDING AGE furnish drawings of a frame for making blue prints and clearly showing



Model of Roof Framing Accompanying Letter of O. K. Snyder, the Plan Being Shown Below

Plan of Roof Framing as Worked Out by a Student at Hampton Institute

the method of constructing a back which is easy to handle and will keep the paper tight against the glass. I would like the frame to measure about 22 x 36 in.

I wish to state that I always look forward to receiving each number of THE BUILDING AGE, for I have been greatly benefited by the articles appearing in its columns.

WATERPROOFING THE BASEMENT OF A BUILDING

From M. L. M., Townsend, Mont.—This place is built in the Missouri River bottom and during the high-water season—April, May, June and July—our basements are flooded with water. It is only about 1 ft. to gravel on an average and during high-water season the water rises within a foot of the surface. I am writing to the Correspondence Department for an expert opinion on the subject of concreting against water pressure and a proper method of treating the basement walls and floor to make them waterproof.

Last September during the low-water season I waterproofed a cellar by putting in the regular 8-in. foundation walls and a 6-in. reinforced floor in the bottom. In the next place, I ran a finish coat on the floor and 5 ft. high on the side walls, then I smeared the floor and walls with hot coal tar pitch and stuck two-ply Ru-ber-oid on it, lapping the joints about 1 ft. I then covered this with 4 in. of concrete.

If any reader of the paper knows of a better method than this or can suggest any improvements on it, I would like to hear from him.

The ice gorged in the river during January, raising the water pressure clear to the surface on the basement to which I have referred. It did not leak this time, but I am wondering if this method will withstand a continuous water pressure during the present usual high-water season.

Note.—In reply to the above communication, Mr. McCullough furnishes the following comments: The Montana correspondent waterproofed his basement by a method that I have advocated for a number of years. The first thing to do in a case of this kind is to prevent the water coming in contact with the walls and the best way is the "membrane method," which means that the walls and bottom are to be covered with several ply of fabric saturated with asphalt and with hot asphalt mopped between the layers.

If the walls will not stand while this work is in progress, then put in a thin concrete bottom and thin concrete walls to hold the earth in place and put this membrane over the concrete, or in such a case the membrane can be dispensed with and the concrete given a thick coat of hot asphalt and tar; then put in the bottom. If the water pressure is not very great the thickness of the bottom can be fixed by remembering that 1 cu. ft. of concrete weighs 140 lb. and 1 cu. ft. of water weighs 62½ lb., the upward pressure of the water being obtained per square foot by multiplying 62½ lb. by the depth in weight. For example: On a 5-ft. depth the upward pressure of the water will be 312 lb. At 140 lb. per cu. ft., this will take nearly 2¼ ft. of concrete, if the weight of the concrete alone is to be considered.

We must remember, however, that a concrete slab possesses considerable strength against bending even when not reinforced, and a man who understands concrete design can figure out the proper thickness of the slab when he knows the span from wall to wall. We have also to take into consideration the fact that the basement floor will have goods piled on it so that the weight it will oppose to the upward pressure of water will be considerable. A very thin slab will resist the pressure of the water when the basement is in use, but when the basement is empty the pressure will be more apt to take effect. This is why it is not a wise thing for people in low-lying lands to empty their basements at time of high water without taking some precautions to see that the basement floor is weighted down.

By using reinforcement in the top of the slab it can be designed as a reinforced concrete floor and the computations are not hard to make. In assuming a span to use in designing a floor to resist upward water pressure, it is common to take 10 ft., because this is likely to be the largest unoccupied span when the basement is filled, and if the concrete and steel are designed at safe stresses for a 10-ft. span, it is quite likely that the span can be double this before there will be any serious cracking.

The side walls are to be designed in the usual manner with the water-tight skin on the outside. The way to make a basement watertight is to prevent the water getting in and by opposing mass to pressure with an impervious skin on the outside, the results wished for will be achieved. I believe the correspondent has nothing to fear from his work, although he does not tell us the size of his basement, nor does he tell us the thickness of his walls. His inside walls with the impervious coating on the outside, he says, are 4 in. thick, and here is the only place he is likely to meet with any trouble, because if water gets in behind the impervious coating it will exert a pressure on the 4-in. wall which may crack it; but if it does not break it down entirely, then the impervious outside coating will keep the water from getting in.

The walls must be thick enough to resist the pressure, and the floors must be thick enough to resist the pressure, if they are of plain concrete, and if they are reinforced of course they must be designed with the pressure in view.

CUTTING BASE BOARDS AGAINST DOOR CASINGS

From W. S. W., Hillsboro, Ohio.—In running over the January issue of the paper, I noticed on page 40 the request of "G. H. C.," Dallas, Ore., for a method of "Cutting Base Boards Against Door Casings." In reply I will describe a method

which I often use not only in cutting base, but in making other joints where a board will not always fit if it be cut off exactly square.

Referring to the sketches, Fig. 1 shows how to cut off the first end of a piece of base. The base may not be square, as indicated by the dotted line, so the carpenter should butt it up against the casing then take a short straight edge and make sure that both edges are parallel; or, in other words, that the piece to be used is the same width at both ends. Take a rule, or the blade of a steel square will often answer the purpose, and hold one edge of it along the edge of the casing and mark down the other edge with a sharp pencil or the point of a knife as indicated in the sketch. Run the edge of the saw in the mark and it will fit against the casing whether the casing be plumb or not. In working in the corner of a room it will be often found that the base against which you

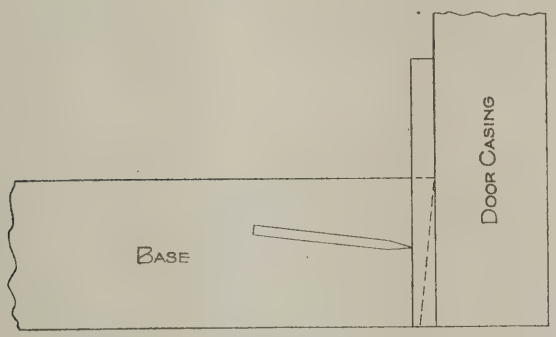


Fig. 1—Showing the Manner in Which the First End of a Piece of Base is Cut off

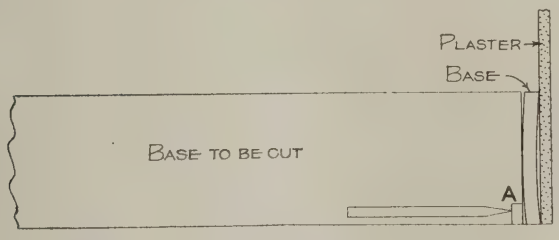


Fig. 2—Method to Be Followed When Working in the Corner of a Room

are fitting will frequently be out of square with the floor, or it may be warped so that a straight cut will not fit, as shown in Fig. 2. In this case take a little block as indicated at "A," Fig. 2, and holding the pencil against this block slide it and the pencil across the base, which will make a mark to give a cut that will just fit over the other piece of base.

Now to cut the other end, mark with the knife on the back corners at top and bottom and square across the edges with the try-square, then lay the blade of the square across the board and with the point of the knife mark across the face. This will fit whether or not it be a square cut, but in this case the base is down on the floor so it is impossible to see under it, consequently take the square and square out from the casing on the floor as indicated in Fig. 3, then put the base down, pushing it back tight at the other end and with the knife mark the face side of the base on the floor and the back corners on the top. Next square across the top edge and mark across the face, cutting to this line.

For marking lengths of moldings, etc., and squaring across boards, to be sawed off, I have never found anything yet that was better than the point of a knife. I prefer a rather small knife for this work, but one that is not too small. I like it best with one blade in each end as it makes the knife easier to handle. I keep the little blade sharp on the point and in squaring across a board keep the edge of the knife slightly turned toward the square so it will not lead away from it. In this manner one may cut almost ⅛ in. deep in poplar or white pine and it makes a mark much easier to follow with the saw than the pencil mark. You can run one side of the saw in this mark and obtain a perfectly straight cut. You cannot mark lengthwise of the grain to do much good in this way unless it is just a short mark such as would be the case in fitting hinges or similar work.

One of the main things in doing a job of this kind is to get the line exactly where it should be and then do not run the center of the saw down the line, but make one side of the teeth run down

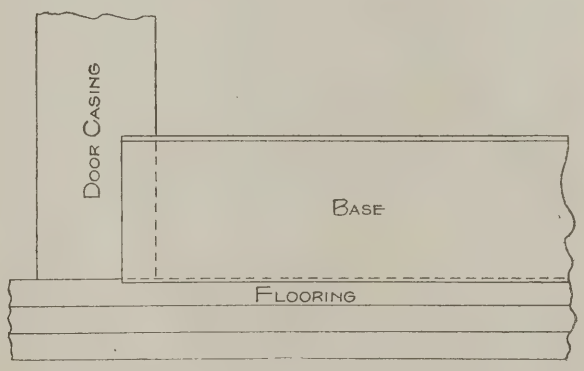


Fig. 3—Method of Cutting the Opposite End of the Base

the line. Of course, sometimes we must use the block plane, but I do not like to do it any more than I can help.

WATERPROOFING A CONCRETE PIT FOR HEATING BOILER

From J. E. Freeman, Engineer, Portland Cement Association, Chicago, Ill.—With reference to the construction of a watertight pit for boiler, on which one of your readers requested information, I would like to submit the following as a discussion of the question:

For watertight basements where there is only seepage, a mixture of 1 sack of cement, 2½ cu. ft. of sand, and 4 cu. ft. of crushed rock or pebbles is satisfactory, but where there is ground water

likely to stand against the wall it is better to use even a richer mixture, such as a 1:2:3. These proportions are necessary if the wall is to be watertight.

Where springs are encountered and the walls and floor of the boiler pit are subjected to the pressure of ground water it is necessary to know the depth of the pit below the floor level and also the height to which the water in the ground surrounding it would be likely to rise. Supposing that if a pipe were sunk below the level of the boiler pit floor, the water would rise in the pipe to a height of 1 ft. above the floor. Then it would be said that there was a head of 1 ft. of water, and as water weighs 62½ lb. per cubic foot, every square foot of the lower surface of the floor of the boiler pit would be subjected to an upward force of 62½ lb. If under such conditions the floor is to be stable and resist cracking against this pressure, the concrete floor must weigh an amount at least equal to 62½ lb. per square foot of area. For convenience in estimating, the weight of concrete is generally considered as 144 lb. per square foot, so it would be necessary to have a 6-in. floor to balance the 62½ lb. per square foot pressure.

The floor and also the walls should be constructed of concrete mixed in the proportions of 1 sack of cement, 2 cu. ft. of clean, coarse sand well graded from finer particles to those just passing a ¼-in. screen, and 3 cu. ft. of crushed rock or pebbles varying from ¼ to 1 in. in size. Such concrete properly proportioned, mixed and deposited will be watertight and the interior surface of the pit needs no further treatment beyond smoothing up any rough places that might be left on the surface after the forms are removed.

The proper consistency for concrete is just sufficient water to make it "quaky," so that when heaped in a pile it will just tend to flatten out, but will not flow readily. A greater quantity of water than this will very likely permit separation of the stone or pebbles from the mortar, and too dry a mixture prevents proper hydration of the cement.

From G. E. J., New Hampton, Iowa.—If "R. S. G." will take a 2-in. auger and bore a hole diagonally under the boiler pit, having the bottom of the hole about 2 ft. below the bottom of the pit, then set a cistern pump in this hole and pump the water out so that no water leaks into the pit and then puts in his cement bottom and bricks, he can keep the water level pumped down below the pit until the cement sets, then he will have no trouble in future. The secret is to keep the water from coming into the cement and making it poor while it is setting.

PROFITABLE SIDE LINES FOR THE BUILDER

From A. W. Ellis, Evanston, Ill.—For a long while I have been considering what would be the best thing for me to do to profitably use my spare time during the winter months. I suppose that other contractors are up against very much the same proposition, and I would be glad if you or any other readers of THE BUILDING AGE will give me an idea of what side lines will prove most profitable. I have, of course, done some building of window and porch screens, also have laid some new floors during the winter months, but have never made any special efforts to secure business of this kind.

I wonder whether it would pay me to take on other lines that are more or less out of my field, such as the agency for chemical closets, heating and plumbing equipment, water supply and electric lighting outfits for country use, etc.

While the building season has really started now, and I do not expect to be able to do much on side lines during the summer, I would appreciate knowing about the experience of other contractors so that I can investigate different lines and their possibilities before another dull season comes around.

BEST PRACTICE IN LOCATING WINDOWS

From R. A. D., New Castle, Pa.—In a residence having ceilings 8 ft. 6 in. in the clear, what is the best practice in locating the windows, that is, the distance of sill or glass line from the floor level; also the distance of the glass line from the ceiling. What is the proportion of square feet of glass to square feet of floor space in a room?

DESIGNS WANTED OF SMALL APARTMENT BUILDINGS

From Designer, Mt. Clemens, Mich.—I would like to see some examples of small apartment buildings that have been erected by readers of THE BUILDING AGE and hope they will send to the editor something along this line for use in the Correspondence Department.

FATAL ACCIDENTS IN BUILDING

"Fatal Accidents Due to Falls in Building Work, Their Frequency, Causes, and Prevention," is the title of Bulletin No. 80 just sent out by the Department of Labor of the State of New York.

FIRE-RETARDING SHINGLE ROOFS

According to the Educational Bureau of the Paint Manufacturers' Association of the United States, exhaustive tests have shown that the use of high-grade paints upon a shingle roof largely eliminates the danger of roof conflagrations, such as are usually started by hot cinders, and burning brands carried through the air from a distance. Exposure tests have shown that high-grade linseed oil house paints upon a shingled roof largely eliminate the danger of flame which such paint affords.

PORTABLE HOUSES ERECTED IN CANADA

SOME GENERAL FEATURES OF THE CONSTRUCTION—DESCRIPTION OF SANITARY DETAILS

SOME interesting features are presented in the portable houses used by the workmen of a Canadian company having the contract for building the aqueduct for the water supply of the city of Winnipeg. The work covered by the company's contracts reaches over 60 miles, and camps are removed frequently. The company therefore devised a system of portable houses which could be taken down, moved on flat cars, and put together again quickly. As the construction work of the company can not be carried on during cold weather, the houses are intended for summer use only, and are therefore provided with single walls. The following particulars may prove interesting to builders on this side of the border:

CONSTRUCTION OF THE HOUSES

The buildings were made up of panels of a maximum height of about 10 ft., some having windows and doors framed therein. The roofs were also made in sections, and the buildings were assembled by bolting through the studding pieces of adjoining panels which acted as flanges. The floors were also made in panels. This permitted the extension of a building to any desired dimensions. The widths were about 14 ft., and the lengths varied, the maximum being for the dining rooms and kitchen, which were as much as 60 ft. long.

In each camp the men were lodged in a bunk house with double-deck steel cots. The bunk house was used only for sleeping purposes, a separate house being provided for entertaining, where newspapers and periodicals were provided. The dining room and kitchen were in a separate building, and the office and residence of the superintendent of each contract were in another building. At each camp a separate wash house was provided, with stationary wash tubs, in which the men could wash their clothes and bathe, as no bathing was permitted in the bunk house.

THE WINDOWS

All the windows and doors of the camp were screened to exclude flies and mosquitoes. In some camps the windows were hung on hinges at the top and pushed out at the bottom. In others the windows were hinged at the bottom and pushed out at the top, which was found to maintain a lower temperature in the summer, but had some disadvantages in case of rain.

At each camp the contractors built a furnace for the destruction of garbage and refuse from the kitchen for the dining camps. This garbage furnace was very simple and quite effective. It was made by digging two trenches, each about 10 ft. long, 1 ft. wide and 1½ ft. deep, intersecting at right angles. Over this intersection an ordinary oil barrel with the bottom knocked out was placed, and instead of at the bottom, pieces of ¼ x 1½-in. flat iron were laid across the top of the trench to form a grate in the bottom of the barrel.

The tops of the trenches adjacent to the barrel were then covered over with boards, upon which clay was packed to a depth of 1 foot or more, leaving at the end of each trench an uncovered hole about 1½ ft. long. The barrel was also enclosed in clay clear to the top. When the clay had dried, fires were started in the holes at the ends of two of these trenches, depending upon the direction of the wind, and the heat baked the clay around the barrel and over the top of the trench and burned out the wood lining. The garbage was then burned by dumping it into the clay barrel, starting a big fire at one end of any trench and closing the other trenches so that the flame and smoke passed through and destroyed the garbage.

The water supply for the camps was looked after very carefully. At most places it was possible to secure good water from driven wells of only moderate depth. In other places it proved necessary to use the swamp water and filter it through sand beds.

There were altogether twelve such camps in use accommodating from 500 to 1000 men. The houses were neatly painted and made throughout of tongued and grooved planed lumber.

NEW DIRECTOR OF FOREST PRODUCTS LABORATORY

Announcement is made by the Forest Service of the appointment of Carlile P. Winslow as director of the Forest Products Laboratory at Madison, Wis. He was graduated from the Sheffield Scientific School of Yale University in 1905, and entered the Forest Service in 1908. Since that time he has been engaged in research work in forest products. For the past four years he has acted as assistant to the director of the laboratory. His familiarity with the work of the laboratory and knowledge of the problems to be studied led to his selection as successor to Mr. Weiss, who resigned April 1.

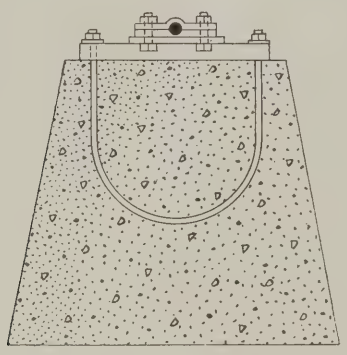
About 350 houses will be erected at McDonald, near Youngstown, Ohio, as the first installment of the accommodations to be provided for housing the employees of the Carnegie Steel Co., which is to erect a new mill at that place. The houses will be of brick, concrete, and other materials, and work is expected to be started very shortly.

SHOP OF AN ENTERPRISING CONTRACTOR

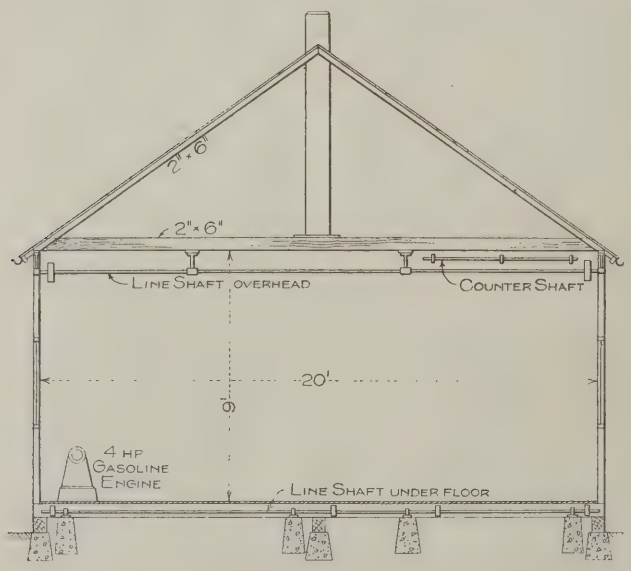
A WELL EQUIPPED ESTABLISHMENT OF A SOUTHERN IOWA CARPENTER-CONTRACTOR AND CABINET MAKER

THE up-to-date workshop of the enterprising carpenter, builder and cabinet maker is always an object of interest to those engaged in the building business, affording as it does an idea of the way in which the equipment is placed, the motive power used and the manner the machines are operated in order to best serve the purpose of the proprietor. In the illustrated description which follows we present a very good example of a shop of the character indicated, the plan showing the general layout of the machines of which the equipment consists, while the several pictures show, among other things, the appearance of the shop with its 9 x 8 ft. front doors, its relation to the house of the owner, an idea of the machinery equipment of the shop as well as some of the many articles which are turned out. It is located in a town of about 1100 inhabitants in Southern Iowa and is said to be one of the most completely equipped shops of its kind in that section. It is owned and operated by J. E. Donaho, Milton, Iowa, to whom we are indebted for the interesting information upon which this article is based.

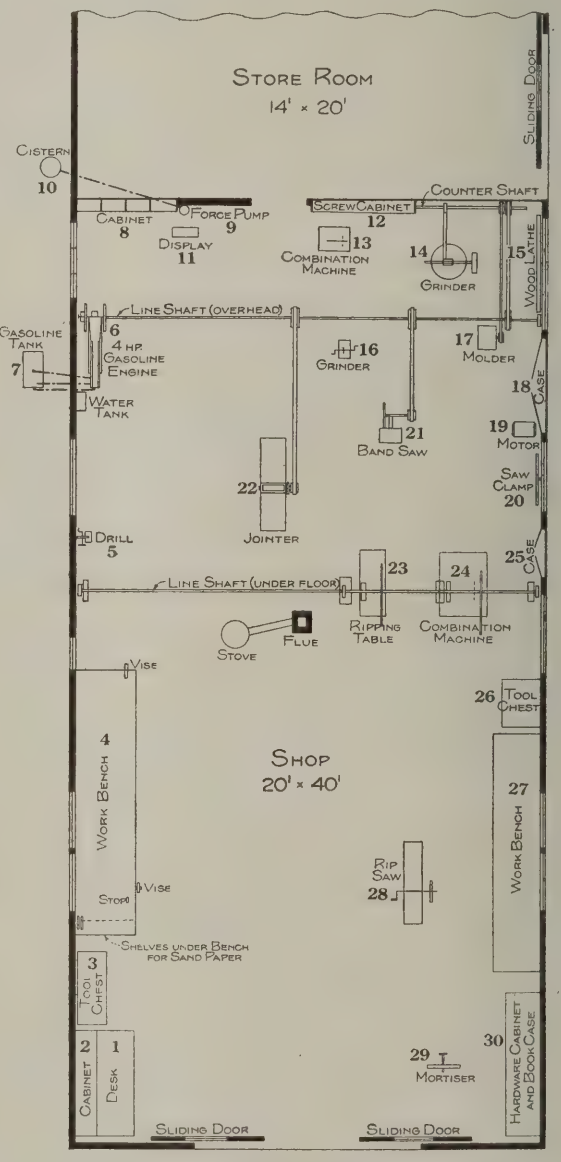
The shop proper covers an area 20 x 40 ft. in plan, at the rear of which is a store room 14 x 20 ft., and having a flat roof resting on 2 x 6 in. rafters. It will be seen from an examination of the plan that most of the machines are concentrated in the rear end, leaving plenty of space toward the front for workingroom and at the same time the ma-



Section of Pillow-Block for Line Shaft Under the Floor



Vertical Cross Section of the Shop Showing Line Shafting



Floor Plan Showing General Arrangement

chines are not in the way of each other. Mr. Donaho points out that the ripping table No. 23 and the combination machine No. 24, for example, are so situated as to give ample room in which to rip 16 ft. stuff, as it is very seldom that it is required to rip anything of greater length. He also calls attention to the location of the jointer designated as rear. The countershaft has two clutch pulleys, so that the operator can throw the machines in and out of gear by means of a lever. This, Mr. Donaho states, was formerly a clutch shaft that came with the molder for reversing the knives, but he extended the shaft and placed it on the rear wall, making use of wall bracket hangers so that he can belt



VARIOUS VIEWS OF THE SHOP AND RESIDENCE OF CONTRACTOR J. E. DONAHO, AT MILTON, IOWA

No. 22, which is placed to one side of the ripping table and to the bandsaw No. 21, which has ample space for it to work.

It will be seen that there is a line shaft extending under the floor, supported by pillow blocks, a detail of one of which is presented herewith, and there is also an overhead line shaft still further toward the up the machines shown. Provision was made for the line shaft extending under the floor when the building was being erected, so that the shaft does not touch the shop in any way.

It may prove of interest to many of the readers to have some further details regarding the various machines with which the shop is equipped, and

we therefore present a brief explanation of the various numbers as follows:

No. 1 is a roll top writing desk and No. 2 a cabinet on top of it. Mr. Donaho is shown in picture No. 7 of the group on another page seated at the desk with a typewriter before him.
No. 3 is a tool chest.
No. 4 a work bench measuring 2 ft. 6 x 11 ft. and fitted with two vises.
No. 5 a hand power post drill for iron.
No. 6 a 4 h.p. gasoline engine as shown in picture No. 8 of the group on another page.
No. 7 a 50-gal. galvanized iron gasoline storage tank under ground to supply fuel for the gasoline engine.
No. 8 a cabinet for engine supplies.
No. 9 a brass cylinder kitchen force pump.
No. 10 a cement walled cistern.
No. 11 a window screen, door and hinge display.
No. 12 a screw cabinet.
No. 13 a Barnes No. 5 combination machine made for foot, hand or belt power.
No. 14 a power emery grinder.
No. 15 a Barnes No. 3 wood lathe.
No. 16 a Luther foot power grinder.
No. 17 a Seneca Falls vertical spindle molder.
No. 18 a case for circular saws, cutter heads and machine knives.
No. 19 a place for the proposed 6 h.p. electric motor which Mr. Donaho intends to install in the near future.
No. 20 a saw clamp.
No. 21 a 26-in. Crescent bandsaw.
No. 22 a Sydney 5-in. jointer.
No. 23 a rip saw table which can accommodate saws up to 16 in. diameter.
No. 24 a combination machine for all kinds of knives and molders.
No. 25 a case of saw sets, jointers and files.
No. 26 another tool chest.
No. 27 a work bench measuring 2 ft. in width and 10 ft. in length.
No. 28 a Barnes hand power rip saw.
No. 29 a Barnes foot power mortiser.
No. 30 a hardware cabinet with book case above as indicated, also in picture No. 6 of the group presented on another page.

In the book case referred to is to be found every issue of THE BUILDING AGE from 1900, also copies of several other journals and books on buildings.

The store room at the rear of the shop is equipped with a stove, so that painting may be carried on in the winter months, a large sliding door affording ample room to take in large frames. The store room has a solid foundation of cement blocks, while the main shop has heavy cement piers every 8 ft. except the front.

Referring to the pictures of the group and not already explained, No. 1 is a view looking toward the rear of the shop and showing the ripping saw table and combination machine in the foreground with the jointer just at the left and with band saw, grinder and molder still further to the rear.

Picture No. 2 is a view taken with the camera placed just to the left of the jointer and pointed toward the work bench under the double window near the bookcase and hardware cabinet in the right hand front corner of the shop.

Picture No. 3 is an outside view of the shop, and No. 4 a view of the house of Mr. Donaho, located about 50 ft. from the shop.

Picture No. 5 shows some of the work which Mr. Donaho turns out as side lines.

Mr. Donaho states that he is a lover of good tools with which to do his work and has nothing in his equipment of which use cannot be made. He states that his shop and equipment has cost $4,000 and that he operates the machines himself, turning out as his main line of work in the building season window and door frames, screens, etc. As side lines he makes art furniture, book cases, bird houses, clock shelves, coat trees and other things likely to be found useful in the rural districts. Owing to the condition of his health, he has practically given up outside contracting and devotes most of his attention to repairing and to the lines already mentioned. He says that a shop equipped like the one here described gives him work nearly all the time and is much more satisfactory than out-of-door jobs.

PATRIOTISM OF THE TRADE PRESS

The loyalty of the publishers of trade papers in the present world crisis is strikingly manifested in the pledge contained in the following letter of the president of the United Publishers Corporation, which places the columns of its papers at the disposal of the Government for the presentation of that information about its needs which will facilitate the promotion of any project undertaken by it during the present condition of war:

April 10, 1917.

Mr. Grosvenor B. Clarkson,
Secretary of the Council of National Defense, Washington.

Dear Sir:

After consultation with our Board of Directors, the United Publishers Corporation has decided to offer to all Departments of the United States Government, the absolute co-operation of our industrial publications, covering many leading industries of this country, both in the matter of editorial co-operation and the free use of advertising space, for the purpose of assisting the Government in the mobilization of our industries, publicity in methods of finance and the promotion of any project undertaken by the Government during the present condition of war.

We cover the Iron, Steel and Machinery industries through the

Iron Age.....New York
Hardware Age.....New York

The Automobile and Motor Truck industry through

Automobile.....New York
Motor Age.....Chicago
Commercial Vehicle.....New York
Motor World.....New York

The Shoe industry through the Boot & Shoe Recorder at Boston.

The Building industry through

The American Architect.....New York
Building Age.....New York
Metal Worker.....New York

The Dry Goods field through the

Dry Goods Economist.....New York
Dry Goods Reporter.....Chicago
Drygoodsman.....St. Louis
Pacific Coast Merchant.....San Francisco

We shall seek to interest the active co-operation of these important business interests in their local centers and shall hope to especially assist in placing the Bond issue without expense to the Government.

In any of these matters your commands will receive our prompt and immediate attention.

Yours very truly,
(Signed) H. M. SWETLAND, President,
UNITED PUBLISHERS CORPORATION.

The first real estate and building show of Akron, Ohio, was held from March 31 to April 7 at the East Market Street Gardens. All sorts of home comforts and building materials were exhibited. One of the features was the façade of an attractive brick and tile bungalow. Green shutters and window boxes, and a brick terrace with flower pots and seats made the building unusually attractive. In front of the terrace was a bit of green lawn, also a lattice pergola and garden seats.

New Publications

Estimating Building Costs. By William Arthur. 218 pages, size 4½ x 7 in. Illustrated. Bound in cloth. Published by the David Williams Company. Price $1.00.

An important addition to the literature upon estimating is contained in the book under review, for it presents in simple fashion the underlying principles of the subject. The author is a man who has written books of a similar nature which have enjoyed widespread popularity, and he has approached his subject with an exceptionally fine equipment for the successful carrying out of the plan of the work—to present in a small book practical and reliable data particularly applicable to those connected with the construction of homes, barns, stores and small manufacturing establishments. In order to successfully cope with the present rapid changes in price and to forestall all changes, up or down, the figures in the book are for the most part given in actual quantities of material required and in actual hours of labor necessary to put them in place—thus allowing costs to be adjusted to suit local conditions and prices; at the same time tending to make the data unchangeable.

The book goes thoroughly into the estimating of such matters as excavating, piling, concrete work, brickwork, stonework, plastering, woodwork, millwork, glass, solid and sheet metal, roofing, painting, plumbing, heating, etc. There is also a valuable chapter on drawing which explains to the tyro just how he should go about the drawing of plans; lettering, abbreviations, symbols, etc.

At the end of each chapter are a number of questions covering that particular section, and a key giving the answers contained is at the end of the book. This feature makes the work of special value to students, classes in Y. M. C. A.'s, in architectural and engineering schools, and colleges. There are 91 tables contained which, together with the illustrations, help make the book one which undoubtedly will prove popular with those anxious to gain a knowledge of the principles of estimating building costs.

Wiring for Light and Power. By Terrell Croft. 425 pages, size 5 x 7¾ in. Illustrated. Bound in flexible cloth. Published by McGraw-Hill Book Co. Price $2.00.

To install electrical wiring and apparatus so that they will be electrically safe and mechanically secure requires an understanding of the principles which have been evolved through the experience of others. Information concerning results required, according to American methods of installation, are contained in the rules or specifications known as "The National Electrical Code." This code has been taken as the foundation of the book under review, and the scheme followed is one which will commend itself to all who work under the code. The main principles as set forth in the code are stated in fine print, and following each code statement is an amplification of the matter in large print and a description of how the work is to be accomplished. Thus the reader can turn to the code rule covering any important point and find out how to meet the requirements.

The book is an extremely comprehensive one, covering generators, motors, switchboards, outside and inside work, wiring, sockets, fixtures, heaters, and other matters dealt with by the code. Reproductions of drawings make clear the points needing illustration. At the end of each section is a list of questions covering that part of the work.

Some Modern Methods of Ventilation. By R. Grierson. 188 pages, size 5½ x 8½, illustrated, bound in cloth. Published by the D. Van Nostrand Co. Price $3.00.

The subject of ventilation is attracting increasing attention because of its aid in promoting human efficiency, and therefore the book under review is likely to interest many, for it presents in simple and concise form the general principles and practices of design of modern ventilating plants. It has been prepared with special reference to public buildings and treats of the standards of ventilation, design of ducts, selection of fans, washers and heaters, specifications, test forms, specimen schedules for designers, apparatus employed, instruments, ozone, etc. Charts, tables and reproductions of drawings and photographs are contained.

THE BUILDING CODE AND THE CARPENTER

As a part of the educational campaign for better buildings, which the National Lumber Manufacturers' Association is extending to manual training schools, R. S. Whiting, architectural engineer for the association recently gave a lecture to 300 students of the Harrison Technical High School on "The Building Code and the Carpenter." Mr. Whiting, after emphasizing the importance of every carpenter and builder producing the best that is in him, and using only such material as is best suited to the service to which it is put—went at length into the value of a good building code to every citizen and builder, as being the basis upon which they should work out all problems of construction and at the same time establish and maintain a substantial standing in their community.

"The building code," he said, "is the evolution of constantly changing methods of construction in growing localities to secure the prevention of fire and the protection of life, health and morals by regulating the inspection, materials, construction, alteration, repair, height, area and location and use of buildings within the corporate limits of states, cities or towns. Codes may be classified in three groups: Large congested cities; smaller cities; rural districts outside corporate limits.

"The cities of more than 150,000 population have usually well compiled codes, but find it necessary to add to them from time to time to meet changing

conditions. While many cities of this size and under are found to have but such building ordinances as have been enacted by force of circumstances or by some catastrophe or incident which aroused the people to see the necessity for them, these ordinances usually grow to a more complete code."

The students were then told of the extensive use of wood in all classes of buildings, and each classification was taken in order and in detail to give them a clear idea as to the value, importance, and extent of wood in each. More time was given to a discussion of the frame building than any other, especially the frame dwelling, as in this type lies the greatest possibility for laxness of construction and the substitution of cheap material which might make it unsafe if the material were not properly used as well as properly protected.

In conclusion Mr. Whiting stated again the value of better buildings to every community, and also the still greater value to every community of better builders, and expressed the hope that all his listeners might be such.

GRADUATING EXERCISES NEW YORK TRADE SCHOOL

The thirty-sixth annual commencement exercises of the New York Trade School, Sixty-seventh Street and First Avenue, New York City, were held on the evening of March 30 in the presence of a large gathering of students, invited guests and friends of the graduates. In his opening address R. Fulton Cutting, president of the Board of Trustees, stated that man's success in life depended greatly on his patience, honesty and gentlemanly behavior. He warned the graduates that employers might ridicule their trade school diploma but said that this could easily be overcome by industrious effort and patience. If a young man demonstrated to his employer that he is competent, he will always be sure of his position. He urged that every man be honest with his employer by giving his full time to his work even though the employers tried to take advantage of the young man's knowledge. He said that the reputation of being a competent, efficient and sober workman is the capital a man has in life and this with his best efforts will pay dividends.

Martin W. Littleton was introduced by President Cutting and in a patriotic and inspiring vein spoke on "Your Attitude Toward Community and Country." He mentioned the ideals of our country—liberty, justice, peace—and told of the daring and courage of the patriots who made these ideals possible. He spoke of the duty of everyone in a community in upholding these ideals and said if they were in danger they must be defended, maintained and held intact so that the country would not be wiped from the earth.

John Byrns of the trade school committee of the Manhattan branch of the Master Plumbers' Association, who has attended nearly every commencement of the school for the past 30 years, said that he had been personally acquainted with the founder of the school, Col. Richard T. Auchmuty, who had done so much for mechanics, and said that his name should be inscribed in gold alongside of that of Peter Cooper. He said that the work done by the students would do credit to any journeyman plumber and that this work had been inspected by the members of the trade school committee to decide on the winner of the gold medal presented by the Manhattan branch to that young man in the plumbing class who showed the greatest proficiency in his work. The lucky man was Albert L. Hockenberry of Martinsburg, W. Va., and Earl L. Bliss of Wellsboro, Pa., received honorable mention. He urged the young men to follow President Cutting's advice to success and to get on top, as there is plenty of room there.

James R. McAfee of the Employers' Association of Roofers and Sheet Metal Workers of New York City, said that the sheet metal business was the best because it was always on top. He said that this was the first year that the association had taken special interest in the work of this school and that the day and night courses of instruction gave a wonderful opportunity to any young man and further that the work done by the students would do credit to many men now working at the trade. Never before has so much sheet metal been used, and it is coming into greater use as lumber becomes scarcer. Because of this, there is a greater demand for competent mechanics and there is always a job for men better than the average and their good work will always bring another job. He then presented Robert K. Turner of Long Island City with an order for a gold medal for his excellent work in practical sheet metal class and W. A. Rader, Jersey City, N. J., was given the same kind of a medal for greatest proficiency in sheet metal pattern drafting.

S. A. Goldschmidt, who has contributed $20,000 to the endowment fund, presented the honor rolls to the young men entitled to them.

James Boyd of the General Society of Mechanics and Tradesmen of New York then presented the diplomas to all the graduates, and the exercises concluded with the singing of "America," led by James R. McAfee.

The total number of graduates was 66 of which 25 were in the plumbing class; 24 in the class in electrical work; 2 in the bricklaying class; 4 in the class in house painting; 2 in sign painting; 1 in pattern making; 5 in steamfitting, and 3 in drafting and cornice work.

MEETING OF LOS ANGELES MASTER BUILDERS

The Annual Meeting of the Master Builders' Association of Los Angeles, Cal., was held in March, a large number being in attendance. The matter of getting all the architects, contractors, subcontractors and others interested in building into one organization was discussed and will be followed up. The Association put itself formally on record as approving the Architects' License Bill and of the Housing Bill, both of which are now before the State Legislature, and expressed its disapproval of

the bill designed to do away with private employment agencies.

The following officers were elected for the ensuing year:

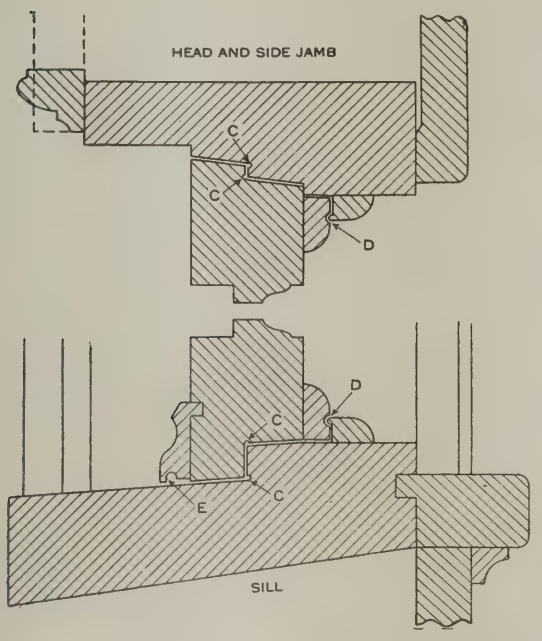
President.....C. L. Peck
Vice-President.....R. H. Arnold
Treasurer.....J. V. McNeil
Secretary.....J. A. Crook
Assistant Secretary.....G. S. Tuite

WATER-TIGHT FRAMES AND SASH

In the recent past there has been more or less discussion of window sash so constructed as to prevent the entrance of water during a driving storm. Various have been the expedients for rendering the sash water-tight and in this connection it will probably prove interesting to many readers to present some comments by a correspondent of the *Wood-Worker* regarding water-tight frames and sash. The accompanying illustrations show the construction suggested both for sash to swing out and to swing in. He says:

"The manufacture of casement frames and sash has been a problem to many, in regard to making them water-tight. The sketches show an inexpensive method that not only makes them water-tight, but also air-tight. Fig. 1 shows a swing-out, while Fig. 2 shows a swing-in sash.

"The small coves, as indicated at *C*, serve as water stops, and drain the water down on the jamb, also prevent it from going any farther on the jamb or sash. *D* serves as a reinforced stop against water or wind. The cove at *E* prevents the water from going any farther at the bottom of sash. This design can be used for either frame or brick houses, as indicated by the staff mold or casing."



Making Water-Tight Frames and Sash—Fig. 1—Section of Casement Frame Sash to Swing Out

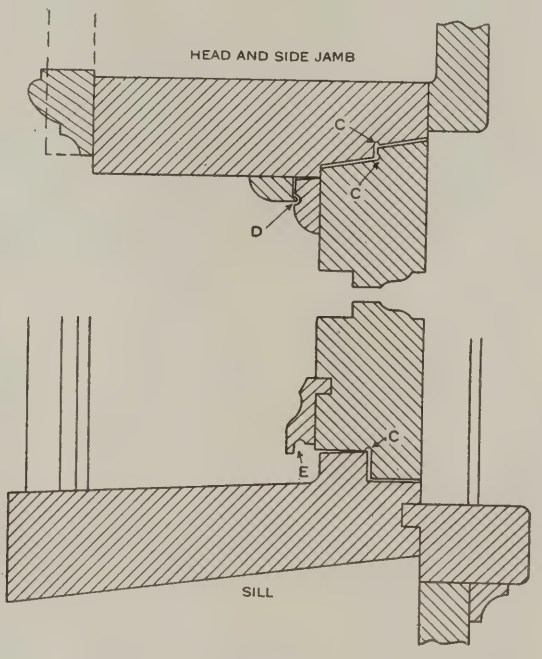


Fig. 2—Vertical Cross Section of Casement Frame Sash Designed to Swing In

DEATH OF GEORGE HENRY SARGENT

George Henry Sargent, president of Sargent & Company, died of the ills incident to a ripe old age, at his home in New York City on Saturday, April 14. Mr. Sargent had long been esteemed as a "Grand Old Man," and commonly alluded to as "Dean of the hardware trade." He had, since his identification with the affairs of Sargent & Company, in 1853, attended constantly to business, early and late, until within a very few years. Mr. Sargent came of sturdy New England ancestors, tracing his descent on both sides to good old English stock. He was born at Leicester, Mass., Oct. 29, 1828, being a descendant of William Sargent, "lay preacher," who came from Northampton, England, in 1638, to Charlestown, Mass., and was made successively Freeman of the Massachusetts and the Plymouth Colonies. Mr. Sargent was educated in Leicester and entered Harvard College in 1849 and afterward attended the Harvard Law School. Later the attractions of business proved stronger than those of the legal profession, and he joined the hardware business established by Joseph B. Sargent in New York in 1849, which was merged into a copartnership in 1853, with Joseph B. Sargent and George H. Sargent as partners, Edward Sargent of Leicester, Mass., entering it later. This proved to be the beginning of a highly prosperous career. From this there developed an interest in hardware manufacturing through the connection of Joseph B. Sargent with a manufacturing plant in the early fifties, which was afterward moved to New Haven, Conn., where a new modern plant was built in 1864, when the manufacturing business was incorporated as Sargent & Company. George Henry Sargent followed his brother, Joseph Bradford Sargent, as president of the corporation, after the death of the latter in his eighty-fifth year in 1907.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS FOR MARCH SHOW 3.14 PER CENT DECREASE OVER MARCH, 1916

ALTHOUGH activity in the building industry throughout the country shows a loss of 3.14 per cent during March, 1917, as compared with the same month last year, yet the falling off is not large in view of the unsettled conditions which have undoubtedly contributed largely to the existing situation in the building trades. It should be remembered, however, that the first three months of 1916 showed a large increase over the same period of 1915 and that the three months of 1917 are only about 1 per cent behind the first three months of 1916. Furthermore, out of a total of 119 cities reporting, 69 show a gain as against 50 showing a loss. The decrease is due in large measure to conditions in the Eastern part of the country, for the cities reporting show a loss of 18.03 per cent for March as compared with March of 1916. It is interesting to note, however, that out of 44 cities reporting from this section of the country, 23 show a gain and 21 a loss. Important cities showing a decrease as compared with last year include Boston, Bridgeport, New Haven, Philadelphia and the larger boroughs of Greater New York.

CITIES IN EASTERN STATES

	March, 1917	March, 1916
Allentown	$166,830	$100,310
Altoona	29,066	21,999
Atlantic City	327,937	132,102
Bayonne	65,850	42,440
Binghamton	179,001	179,939
Boston and suburbs	2,778,000	3,967,000
Bridgeport	650,676	1,018,497
Brockton	46,280	44,285
Buffalo	625,000	899,000
East Orange	199,464	60,018
Elizabeth	191,630	118,723
Erie	322,189	218,799
Harrisburg	183,245	68,975
Hartford	985,695	590,120
Hoboken	36,345	6,036
Holyoke	31,740	118,950
Lawrence	81,800	200,405
Manchester	60,846	105,605
Newark	540,042	783,790
New Bedford	31,825	495,625
New Britain	16,915	52,285
New Haven	215,096	520,560
New York:		
Manhattan	6,418,755	8,580,439
Bronx	1,474,191	2,285,938
Brooklyn	4,232,142	4,250,128
Richmond	269,057	206,229
Queens	1,871,400	2,717,144
Niagara Falls	73,233	324,787
Nutley, N. J.	53,531	30,204
Passaic	294,500	91,106
Paterson	328,543	107,668
Philadelphia	3,486,625	4,590,630
Pittsburgh	1,214,521	1,767,612
Portland	47,030	112,575
Reading	75,050	48,925
Rochester	653,396	596,243
Scranton	171,323	40,410
Springfield	739,362	535,968
Syracuse	290,640	177,145
Trenton	210,338	235,504
Troy	49,335	35,375
Utica	114,120	37,925
Wilkes-Barre	72,042	173,255
Worcester	624,761	557,380

The middle section of the country shows a gratifying gain of 13.99 per cent, 24 cities out of a total of 38 contributing to this result. Notable increases are found in Akron, Detroit, Fort Wayne and South Bend.

CITIES IN MIDDLE STATES

	March, 1917	March, 1916
Akron	$1,756,140	$524,715
Canton	400,875	529,200
Cedar Rapids	375,000	113,000
Chicago	11,519,650	11,477,100

CITIES IN MIDDLE STATES (Continued)

	March, 1917	March, 1916
Cincinnati	1,227,365	948,500
Cleveland	1,973,030	1,838,465
Columbus	571,245	868,935
Davenport	91,444	96,084
Dayton	130,327	356,240
Des Moines	261,149	405,944
Detroit	4,496,235	3,677,785
Dubuque	309,450	4,850
Duluth	2,088,080	237,950
East St. Louis	77,150	30,292
Evansville	80,945	139,490
Fort Wayne	657,815	115,025
Grand Rapids	200,455	617,020
Indianapolis	64,906	48,235
Kansas City, Kan.	191,125	55,460
Kansas City, Mo.	1,478,740	1,226,620
Lincoln	144,966	153,040
Milwaukee	1,228,634	737,815
Minneapolis	710,045	1,386,805
Omaha	365,385	346,805
Peoria	162,853	151,170
Saginaw	137,363	81,215
St. Joseph	193,109	214,303
St. Louis	1,279,144	1,761,781
St. Paul	463,765	1,064,452
Sioux City	111,850	552,680
South Bend	123,737	12,529
Springfield, Ill.	94,140	670,785
Superior	188,255	18,255
Terre Haute	64,960	48,235
Toledo	1,149,269	1,022,495
Topeka	61,845	51,440
Wichita, Kan.	618,995	145,950
Youngstown	323,475	176,313

Considering the Southern States, out of 21 cities reporting 16 indicate increased activity as compared with a year ago as against 5 reporting a loss, the percentage of increase being 9.49 per cent.

CITIES IN SOUTHERN STATES

	March, 1917	March, 1916
Atlanta	$499,213	$458,401
Baltimore	1,122,970	1,305,111
Birmingham	235,783	188,426
Charlotte	81,291	65,968
Chattanooga	82,977	184,015
Dallas	1,002,195	452,891
Fort Worth	480,520	202,992
Jacksonville	168,304	66,100
Houston	197,166	169,432
Huntington	189,245	68,975
Louisville	230,690	361,270
Memphis	329,150	306,060
Montgomery	66,910	47,849
New Orleans	284,471	248,936
Oklahoma City	354,575	216,075
Richmond	490,866	593,720
San Antonio	203,635	199,470
Savannah	101,475	57,300
Tampa	142,635	116,245
Washington	627,363	1,579,301
Wilmington	715,236	108,326

The Western section of the country shows a loss of 17.10 per cent., as out of 16 cities reporting only 6 show a gain. Colorado Springs, Denver and Stockton show appreciable gains.

CITIES IN EXTREME WESTERN STATES

	March, 1917	March, 1916
Colorado Springs	$49,875	$27,607
Denver	541,110	386,390
Los Angeles	1,339,960	1,416,535
Oakland	540,672	910,680
Pasadena	164,829	175,132
Portland	262,200	420,560
Pueblo	55,365	40,454
Sacramento	132,023	109,497
Salt Lake City	203,150	314,550
San Diego	109,585	203,312
San Francisco	2,040,727	2,512,328
San Jose	24,665	52,445
Seattle	583,795	735,785
Spokane	131,235	246,059
Stockton	116,062	88,325
Tacoma	176,173	168,122

CURRENT NEWS OF BUILDERS' EXCHANGES

BANQUETS, ANNIVERSARY CELEBRATION, ELECTION OF OFFICERS, ETC.—NEW EXCHANGE AT SIOUX CITY

The Duluth Builders' Exchange

IN outlining the aims and scope of the local organization Secretary L. R. Ardouin of The Builders' Exchange of Duluth, Wis., expressed the following views:

"Our Builders' Exchange endeavors to acquire a knowledge regarding the activities in building lines in this city and district. This information regarding present and future trade is conveyed to the members, thus keeping them in close touch with the development of the territory.

"Accurate building reports furnish the surest barometer of trade conditions because a building is the forerunner of other business in the same way as public improvements are a means of calculating whether a community is progressive and prosperous. Other business is bound to come with activities in the building line. Buyers of stocks of merchandise for new stores, those having hotels, churches, schools, homes, etc., to equip as a rule, buy from the same market as that which furnishes materials used in the construction of the building. Of course this naturally attracts many new customers to the city yearly.

"In this and countless other ways the Builders' Exchange aids in making the city a market for not only the building industry, but helps it to be the buying center of many other kinds of business. The new buyer, who is invited to come here to place orders, is encouraged to come again by the Exchange, because he is made to feel at home and receives much information.

"Connections are thus established that are surely a great benefit to the city.

"It is a constant endeavor of the Builders' Exchange to be one of the city's greatest assets. Duluth is made known, not as a place of individual enterprise but as a great and important market for every line of business."

Banquet of Springfield Builders' Exchange

The eleventh annual banquet of the Builders' Exchange of Springfield, Ohio, was a pleasant affair, and much enjoyed by the 113 persons present. One of the features was the installation of the following officers:

President.....B. O. Largent
Vice-president.....H. C. White
Secretary..... Donald Kirkpatrick
Treasurer.....Thomas A. Welsh

An interesting address on Building Codes was made by Virgil G. Marani, who has been instrumental in the writing of the building code for Springfield, and he pointed out that the drafting of such a code should not be dictated through politicians. An interesting address was made by Paul C. Martin, who spoke on "The Reincarnation of the Community Spirit."

Twenty-fifth Anniversary of Toledo Builders' Exchange

The members of the Builders' Exchange of Toledo, Ohio, celebrated on March 7 the twenty-fifth anniversary of the organization. The attendance and enthusiasm are said to have been the greatest of any gathering since the formation of the Exchange. All formality was laid aside and everybody seemed to enter heartily into the spirit of the occasion. W. J. Albrecht gave a history of the organization from its birth in 1892, pointing out in the course of his remarks the great growing force of the Exchange. Other speakers were Charles Lawton, assistant city solicitor, D. S. Hollenger, secretary of the Monroe Chamber of Commerce and also of the Monroe Builders' Exchange.

After the regular meeting the members adjourned to the dining room where refreshments were served and brief talks were given by various members. Secretary Albrecht served as toastmaster.

Banquet of Plattsburg Contractors' Association

The members of the Building Contractors' Association of Plattsburg, N. Y., held their first annual banquet at the Elk's clubhouse on the evening of March 19. A number of invited guests were present and brief talks were made by several of them. One of the most interesting addresses was that of S. E. Fitzpatrick of the firm of J. J. Fitzpatrick & Sons, who referred to the work of building contractors from early times up to the present.

Officers of Los Angeles Builders' Exchange

At the recent annual election of the Builders' Exchange of Los Angeles, Cal., officers were elected as follows:

President.....James H. Bean
First Vice-presidents..... W. R. Simons
M. Stepan
W. L. Yard
R. A. Warren
Second Vice-presidents.....H. C. Hayward
S. L. Weaver
Treasurers.....J. Griffin
D. P. M. Little

A new constitution was adopted by a unanimous vote to take the place of the old one.

Builders' Exchange at Sioux City

The leading building contractors, dealers in building materials, architects and others interested in the building industry have taken steps looking to the formation of an organization to be known as the Sioux City Builders' Exchange. The purpose of the organization is to keep Sioux City building men in closer touch with construction activities with the idea of bringing more business to local architects, contractors and allied branches of the trade. At the first meeting F. L. Hutchins was chosen chairman of the organization committee and with him were associated C. A. Dubel, F. C. Mariner and John P. Schnable.

Important Meeting of Flint Builders' Exchange

The members of the Builders' and Traders' Exchange of Flint, Mich., held an important meeting at their quarters in the Dryden Building on the evening of April 13. Although the Exchange has been organized but a comparatively short time, the membership has assumed goodly proportions and the influence of the organization has spread to many of the other cities of the state. The demand for membership and for booth space in connection with its Exhibits of Building Materials has assumed such proportions that larger quarters are re-

quired and a move will soon be made to secure them. On April 12 a special car took some of the members to Detroit where they were the guests of the members of the Builders' and Traders' Exchange of that city.

Boston Master Builders' Activity

A booklet entitled "Advantages and Opportunities for Membership" has been compiled by the Master Builders Association of Boston, Mass., and in the section devoted to the record for 1916 the association's activity is evidenced by the manner in which it follows up bills introduced in the Massachusetts Legislature, working for or against them as deemed advisable.

Detroit Builders Enjoyed Convention Trip

The March issue of the *Bi-Monthly Magazine* of the Builders and Traders Exchange of Detroit, Mich., contains an entertaining account of the recent trip to the Atlanta convention, the itinerary being carried out practically as stated in the February issue of the BUILDING AGE. The trip was much enjoyed by the members and their friends, who hope to indulge in a longer trip when attending next year's convention in Pittsburgh. The issue also contains various other items concerning the activities of the exchange, as well as matters of general interest.

New Officers of Memphis

The Builders' Exchange of Memphis, Tenn., recently elected officers for the ensuing year as follows:

President.....I. N. Chambers
First Vice-Pres.....R. E. Montgomery
Second Vice-Pres.....A. W. Burdick
Secretary Pro Tem.....Miss A. L. Berton
Treasurer.....J. W. Williamson

Various committee appointments were also made.

Recruiting Campaign by Baltimore Builders' Exchange

Secretary I. H. Scates of the Builders' Exchange of Baltimore, Md., has by authority of the Board of Directors recently addressed a letter to the members calling attention to the request of the Maryland Recruiting Committee regarding the matter of urging young men to join the navy. The letter asks each member to constitute himself a committee of one to assume the duty of urging and bringing to the attention of all persons the absolute necessity of everyone doing *his full duty.*

The first 800 who enlist will be classed as the Honor Roll and it is proposed to erect a bronze tablet in the State House at Annapolis on which their names will appear. The letter in question concludes with the words, "Why not make it your patriotic duty to secure at least one enlistment for this honor roll."

Saturday evening, March 24, was the occasion of a most enjoyable affair at the Emerson Hotel—a dinner being tendered by the delegates from this Exchange to the ladies who accompanied them on their recent trip to Atlanta and New Orleans. A splendid menu, delightful entertainment, a unique menu card as a souvenir of the trip, giving the itinerary and a map of the route which had been traveled, was presented each member of the party. The ladies were recipients of a solid silver pencil engraved with their initials. Vocal and instrumental music was a feature of the evening's entertainment.

A general feeling of good-fellowship prevailed and resulted in the organization of the "Mardi Gras" Association of the Builders' Exchange of Baltimore City. The association is rather exclusive in that only members who made the trip to Atlanta and New Orleans were eligible to membership. The officers elected in the organization of this association were as follows: President, Mrs. A. J. Dietrich; first vice-president, Mrs. Henry Franklin; second vice-president, Mr. P. J. Cushen; secretary, Mrs. I. H. Scates; treasurer, I. H. Scates.

HOUSES FOR WORKINGMEN

An indication of the movement which is more or less general throughout the country for industrial establishments to provide housing accommodations for their workingmen, is found in the contract secured by the A. & S. Wilson Company of Pittsburgh for the first 275 houses of the 1000 to be built on Goodyear Heights, Akron, Ohio, for the Goodyear Rubber Company. The contract amounts to about $500,000 and the houses have been planned by George Schwan of Pittsburgh, Pa.

The houses are to be sold to employees for 25 per cent in excess of actual cost but when an employee who has bought or is buying a house, has been with the company for five years, the 25 per cent is returned to him when his house is entirely paid for and the property is deeded to him at actual cost without interest.

FOREIGN DEMAND FOR BUILDING MATERIALS

The members of the American Commission to France appointed to study reconstruction conditions abroad have just returned and report that there is an unquestioned demand developing for portable temporary buildings, materials for construction of permanent factories and residences, metal ceilings, window and door sash, Portland cement, lumber, rolled steel, and possibly basic clay products; in fact, any kind of material that will facilitate quick construction.

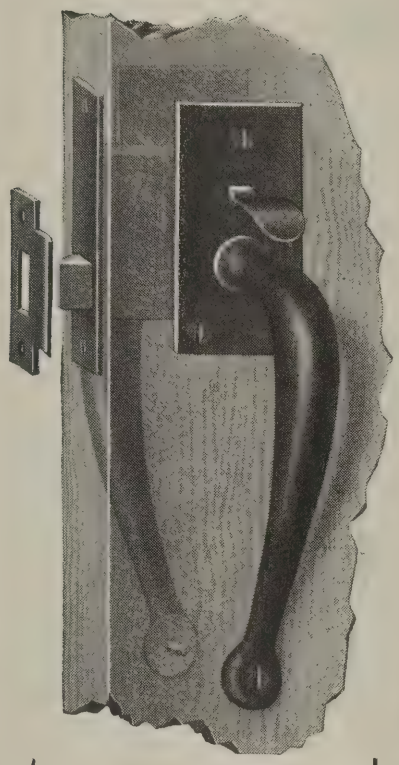
CONCRETE VS. FRAME HOUSES

As the results of a series of experiments which have been performed in connection with concrete houses, the statement is made in the *Cement World* that a temperature of 10 to 15 degrees lower than that in frame houses may be expected in summer and that a fuel saving as high as 20 per cent is often obtained in winter.

At the recent quarterly meeting of the General Executive Board of the United Brotherhood of Carpenters and Joiners of America, which has a membership of about 270,000, the services of the organization was offered to the United States government. The resolution states that when men are required for industrial service at any particular designated point, the Brotherhood will co-operate with government officials in supplying the necessary men.

The first home and real estate show of Milwaukee, Wis., was held from April 10 to 19, and enjoyed the success that its many excellent exhibits deserved. One of the features was a five-room bungalow designed by Schnetzky & Son, about thirty firms contributing to the erection and furnishing of the building. Music and movies formed part of the entertaining features.

The National Garage Door Latch



Makes a Good Looking Garage Look Better

Get in your orders early and be prepared for the spring garage business.

The No. 27 Door Latch packed with the No. 801 Set will appeal to every one. It will especially delight those of discriminating taste. Its graceful lines, extreme simplicity and elegant finish lend an air of elegance to the appearance of the garage.

It's reversible—right or left door. It can be sherardized or plated any finish desired.

Packed neatly, complete with screws, in a strong box. It's our No. 27 Garage Door Latch. Ask your dealer to show it to you. If he has none send us his name.

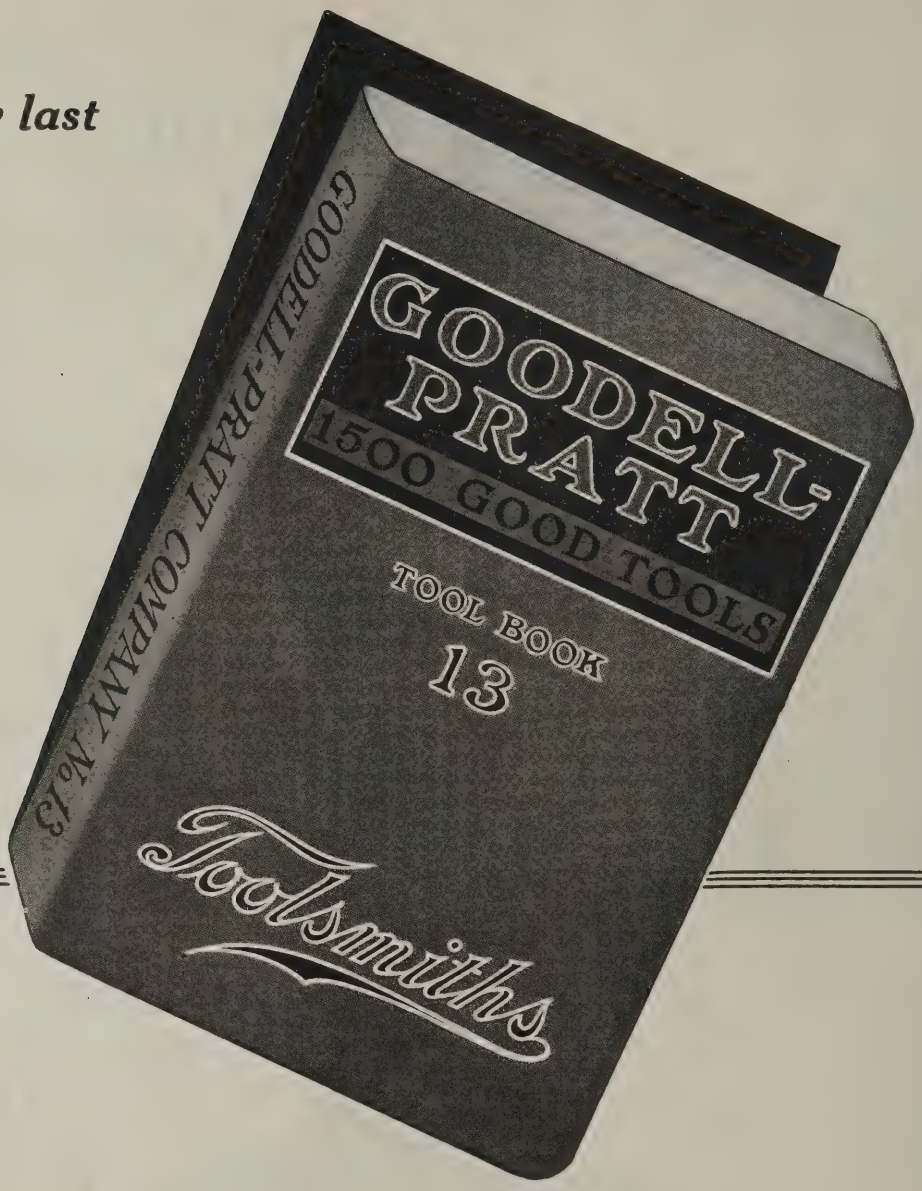
NATIONAL MFG. CO.

STERLING, ILL.



FREE

while they last



Our Book of Good Tools has just been received from the printers. It is revised and enlarged, giving full particulars about every tool that we manufacture.

Think of having in this convenient pocket form this handy reference book of tools thoroughly indexed! You need some odd tool—wonder where to get it—and you find it listed with full particulars in this 432-page book.

There is a copy waiting for you, but if you don't write now, you may not get it.

GOODELL-PRATT COMPANY

Greenfield *Toolsmiths* **Mass., U. S. A.**

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

Steel-Sewed Columns a Factor in Remodeling Houses

There has recently been completed in the Central West a most interesting job of remodeling an old house into a modern structure, which is now regarded as one



Fig. 1—Appearance of the Dwelling Before Remodeling

of the finest homes in that section and in connection with which use was made of a number of large fluted columns. In Fig. 1 we show the appearance of the house before it was remodeled, while in Fig. 2 we show the building after the work had been completed. The operation was carried out under the supervision of the architects, A. H. Ellwood & Son, of Elkhart, Ind., and in the operation of remodeling use was made of sixteen fluted columns, each having a diameter of 26 in. and a length over all of 22 ft. 10 in. The capitals were of a type which may be described as Italian Renaissance Composite. They were 33 in. in height and had 23-in. necks. The square bases were 34 x 34 in., and each column complete with caps and bases weighed approximately 1000 lb. The house remodeled was that of



Fig. 2—Change Wrought by Use of Columns in Remodeling

Colonel C. G. Conn at Elkhart, Ind., and the steel sewed columns used were made by the American Column Company, Battle Creek, Mich., to whom we are indebted for the photographs from which our illustrations were made.

Stover Fireplace Fixtures

An attractively printed folder profusely illustrated and relating to improved fixtures is being sent out to building contractors, dealers and jobbers interested in goods of this kind by the Stover Manufacturing & Engine Company, Freeport, Ill. This is one of the old reliable concerns making hardware and implements, and the fireplace fixtures comprise but a very small part of the goods it turns out. The products illustrated on the folder include andirons, dampers of various kinds, ash trap doors, clean out doors, cistern covers, fire baskets, both ornamental and plain, fire sets, etc., etc.

Narrow Concrete Walks Along the Street Curb

We have received from William M. Kinney, engineer of the Promotion Bureau of the Universal Portland Cement Company, Chicago, Ill., a photograph from which the illustration in Fig. 3 has been made, together with the following comments, which are self-explanatory. This photograph, taken on Fargo Avenue, Chicago, demonstrates that luxuries of to-day are necessities of the



Fig. 3—Narrow Concrete Walks Along the Street Curb

morrow. Not long ago we were so well contented to ride in automobiles that such a little thing as stepping out and walking through the mud of the parking was merely vexing, but to-day it has become exasperating. To pacify the dwellers of large modern apartment buildings in Chicago, narrow concrete walks are built along the curb, with a crosswalk opposite the entrance. With this convenient arrangement the car can arrive at any place along the curb and my lady's slippers are neither soiled nor is American chivalry assailed for lack of a Sir Walter. These walks are generally 12 in. wide plus the width of curb and are built similar to a sidewalk.

Exhibit of Sheldon's Slates

Among the attractive exhibits recently installed in the Country Life Permanent Exposition above the main waiting room of the Grand Central Terminal, New York City, is that of the F. C. Sheldon Slate Company, Granville, N. Y. This exhibit represents a most up-to-date

achievement in the production of out-of-the-ordinary and distinctively artistic types of roofing slates in varying tones and color combinations. These different types of slate have been laid up on miniature roofs in such a way as to afford an excellent idea of just how the slates appear after they have been applied. We understand that a great many visitors have been attracted by this display, more especially architects, building contractors, roofers, house owners and others interested in the roofing question. The company calls attention to the use of its square slate in sizes 14 x 14 and 12 x 12 as supplying a most satisfactory substitute where a more durable roof covering is desired than can be obtained by the use of artificial material. There seems to be a steadily increasing demand for these square slates, and the company states it is now carrying them in stock to permit prompt shipment of all orders received for them.

Martin Semi-Trailer Outfits for Small Tractors

A short time ago we called attention in these columns to one form of semi-trailer employing the Martin Fifth Wheel which has been brought out by the Martin Rocking Fifth Wheel Company, Springfield, Mass., and we now take pleasure in calling attention to another type of semi-trailer which cannot fail to interest many of those engaged in the building business. In Fig. 4 we show the Martin Semi-Trailer attached to an adapted Ford car; in Fig. 5 we show the rear system which replaces the more vulnerable parts of the horse wagon, while in Fig. 6 is shown the extension reach trailer for hauling lumber, etc. The point is made that the Martin Semi-Trailer for Ford Cars or light runabouts will carry a one-ton load without in any way straining the car, the semi-trailer simply utilizing the well-known principle that a horse can pull a great deal more than it can carry. The semi-trailer is so designed that only that portion of the load which equals the amount intended by the maker of the car for it to carry rests over the driving wheels of the car. The balance of the load ranging from 60 per cent to 75 per cent is carried over the semi-trailer axle. The claim is also made that this semi-trailer can be backed, turned and handled with ease in the narrowest street. It permits the owner to use his Ford car for pleasure purposes as well as hauling, as six minutes' work will transform the car back into a purely pleasure vehicle with no signs that it has been used for commercial purposes. The extension type of semi-trailer for lumbermen's use is made to carry 24 ft. lumber with a 5 ft. overhang and constructed to stand a speed of twenty miles per hour with a one-ton load. A very attractive catalog which the company has issued under the title, "The Final Answer to the Hauling Problem," contains a great deal of information regarding these outfits which cannot fail to interest the building contractor now using horse teams for hauling his material.

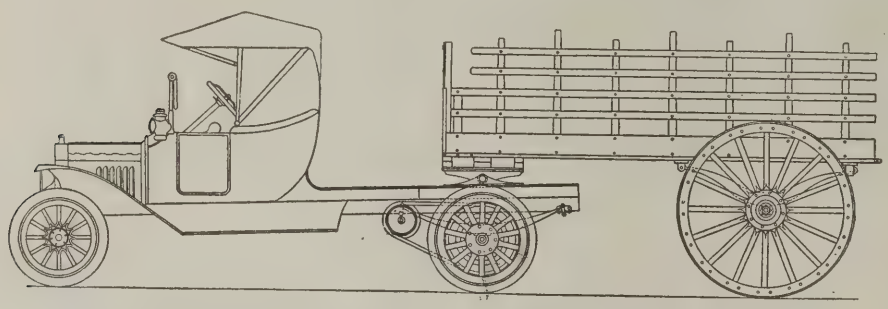


Fig. 4—Showing the Martin Semi-Trailer Attached to an Adapted Ford Car

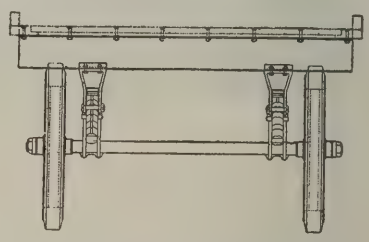


Fig. 5—The Martin Rear System Which Replaces the More Vulnerable Parts of the Horse Wagon

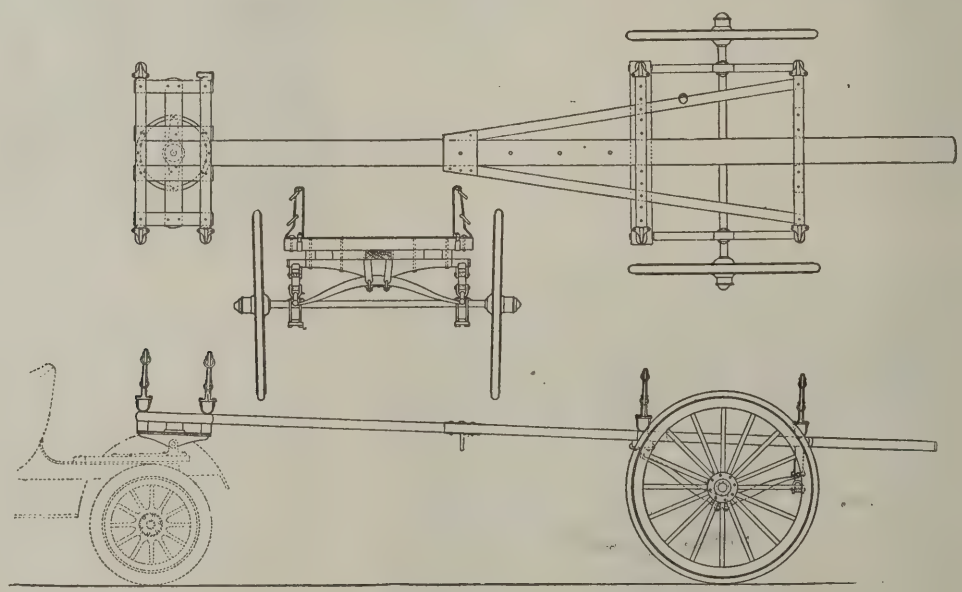


Fig. 6 — (At the Right) The Extension Reach Trailer for Hauling Lumber, Etc.

Pearl Wire Cloth

A field in which carpenters and builders may enter with prospects of profitable results is the making of window and porch screens in connection with which attention is being directed to the merits of G. & B. Pearl Wire Cloth, through the medium of some interesting literature sent out by the Gilbert & Bennett Mfg. Company, 940 First National Bank Building, Chicago, Ill. Samples of the wire cloth in question are attached to

(*Continued on page 22 of the advertising section*)



Build at Guaranteed Costs

TO the contractor and builder, the important thing about Gordon-Van Tine Homes is that they are all **absolutely practical.** They can be **built** at the prices at which they are figured. The cost of the materials complete is **guaranteed** no matter in what **part** of the country they are to be erected. Regardless of local conditions, **the price is the same everywhere.** And thus the contractor is **protected**—assured of a **satisfactory job** and **a known profit.**

Ready-Cut or Not Ready-Cut

Ready-cut to fit, cutting your construction costs and helping solve your labor problems. Or **not** Ready-cut—just as **you** prefer. We price our houses **both** ways. Material **strictly** up to **standard** grades **always.** And all sold you **direct from mill** at WHOLESALE! You cannot buy better; you cannot pay less and get equal value. Houses built in **every** State—some near you; **local references** on request. Suitable for **all climates.** Each plan **proven** through actual **building** by hundreds of contractors. Over **100,000 homeowners and 10,000 contractors** vouch for us. **We add $200 to $500 to your profits on each house.** Buy **now** and get the **same** prices you would have paid **locally** six months or **even a year ago.**

Write for Our FREE Home Plan Book



Shows 5 to 10 rooms, **two story homes,** 6 to 9 rooms, **story and a half cottages,** 4 to 7 rooms, **one story cottages,** 3 to 6 rooms, charming **Colonial residences** selected from the best types of New England, inviting **bungalows,** 3 to 6 rooms. Gives **photos, plans, Guaranteed Prices. Convenience ideas** for women. **Built-in pantry cases, linen closets, 2-panel Fir doors, bungalow trim** for mahogany or other stain. **Over 200 perfect plans** for your selection. Remember, this unusual book is FREE to any contractor or builder **on request.** Send for it **today. Use the coupon.**

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861 Federal Street, Davenport, Iowa.

Please send me FREE the books checked below:

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- ☐ Roofing Samples
- ☐ Summer Cottages
- ☐ Garages
- ☐ Wholesale Lumber Price List
- ☐ Barn and Out-Building Plan Book
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861 Federal Street, Davenport, Iowa

In Business Over Half a Century

Varnish that stands by you

Woodwork is the most conspicious feature of interiors, so everyone wants well-finished floors, stairs and trim. How will your work look a year from now? Are you protecting it with good varnish?

Very likely you get little encouragement to do fine varnishing. People don't know it is worth while to pay for it. But you do.

And the public can be taught. We are urging good varnish and good varnishing in all the leading magazines.

Murphy Varnish

"the varnish that lasts longest"

produces a finish that brings out every good point the wood has and keeps your work looking well for years. Yet it costs you no more to use than a cheap varnish, if you figure by the job instead of by the gallon. It covers more surface and goes on more easily, making quite a saving in labor. Its extra length of life costs nothing and is worth much to you and to your customers.

Our principal house-finishing products are:

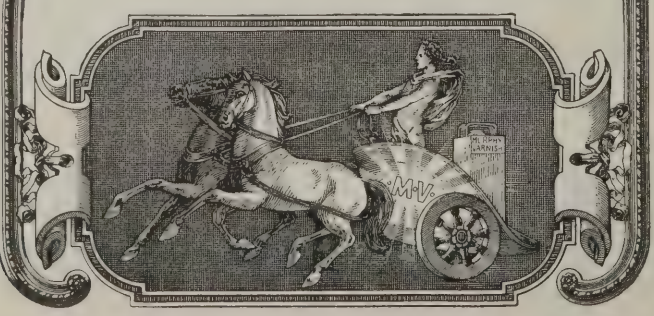
Murphy Transparent Interior Varnish
Murphy Transparent Floor Varnish
Murphy Transparent Spar Varnish
Murphy Nogloss Interior
Murphy Semi-Gloss Interior
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate



(Continued from page 284 of the editorial section)

one of the pamphlets issued by the company, the cloth being made in two weights. The regular grade is usually employed for doors and windows, while the extra heavy grade is used where a greater strength and body is required than is afforded by the regular grade. This steel wire of which the cloth is manufactured is protected by a handsome weather-proof metallic coating from which the name "Pearl" is derived. This coating is said to be permanent and that it will not crack, chip or peel, and through the process of application "actually becomes part of the wire itself." This weatherproofing or coating, which is used, is said to make a Pearl wire cloth as near rust-proof as metal can be. The smooth, clean meshes are said to offer no lodging place for dust or dirt, and that owing to its color and nature it offers, but very little more obstruction to the view than a sheet of clear glass while under the usual light conditions it effectually blocks the gaze of curious passersby while affording an unobstructed view to the occupants of the house. Another pamphlet sent out by the company is entitled "The Porch Problem Solved" and shows the method of inclosing porches so as to make them convenient out-of-door living rooms or sleeping porches, as the case may be. Two pages are devoted to showing the installation of portable screen panels which rest on the floor of the porch and are so constructed that they lock together, closing in the open sides of the porch. We understand that copies of these pamphlets may be obtained on application to the company.

The "American" Metal Shingle

One of the latest candidates to popular favor in the way of a metal shingle is the "American," an illustration of which appears in Fig. 7, and which is being introduced to the attention of architects, builders and

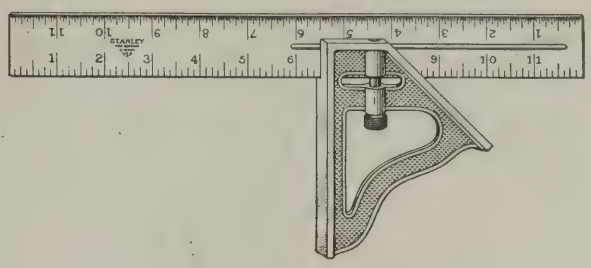


Fig. 7.—The "American" Metal Shingle

property owners throughout the country by the Milwaukee Corrugating Company, Milwaukee, Wis. The shingle is said to be so made as to render it fireproof, waterproof, easy of application, reasonable in cost and more than ordinarily attractive. In designing this new metal shingle, simplicity of design was the predominating idea, and attention is particularly called to the high butt end, which gives a very pleasing appearance when placed on a roof. We understand that this metal shingle has been thoroughly tried out under all conditions and has proven very satisfactory. The shingle is made in six different styles, by the interchange of which an unlimited number of combinations are possible, thus giving to a roof a very natural shingle appearance. The shingles are furnished painted red or green and are galvanized after formation. The company has also designed and is making a special set of trimmings to be used in connection with this shingle, the idea being to give to the finished roof a complete harmonious effect. We understand that the company

(Continued on page 24)

Stanley Tools



Stanley Adjustable Try and Mitre Square No. 21

One of the handiest tools in a Carpenter's Kit. Especially useful for doing short work about windows, doors, etc., or in putting on butts or locks.

The Blade is adjustable, and as it can be reversed, provides any size of try or mitre square within the capacity of the tool. In reversing, it is not necessary to remove the blade from the handle, consequently the tool is always assembled and ready for use.

The locking device is such as to insure the blade being firmly and accurately secured at any point desired. The edges of the Blade are machined, graduated in 8ths, 16ths and 32nds of inches, and the tool is square inside and out.

It is also an excellent depth and marking gauge.

Both Handle and Blade are nickel plated. Made in three sizes—6—9—12-inch blades.

If you cannot procure this at your Hardware Dealer's, write us direct.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

PROFIT



For Store Front Builders

In every city and town new store fronts are in the planning or building. Retailers now realize the absolute necessity of attractive windows. This country-wide movement is making a big opening for builders and "Desco" store front construction makes possible the maximum of net profit. For it is simple in construction, easy to properly install, strong, protects the glass and low in cost—lower than you've been accustomed to pay. "Desco" is the result of our 28 years of experience. Be sure to get details and prices—gladly sent upon request. Be ready to bid—be in a position to get the next job. A card will do.

Desco METAL STORE FRONTS

Detroit Show Case Company

483 Fort Street, W., Detroit, Michigan



Our Guarantee to Builders

goes with every product that we manufacture. It is the permanent trade-mark in the enamel of each KOHLER bath tub, lavatory and sink. You get rid of all risks by selecting

KOHLER WARE

"It's in the Kohler Enamel"

Always of one quality—the highest

One-piece construction and modern, hygienic patterns are important features of KOHLER products.

KOHLER WARE is notable for the beauty of the enamel.

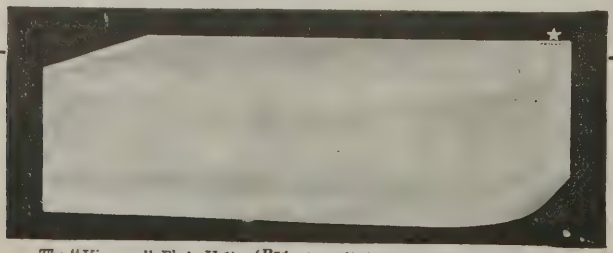
Our products are designed to simplify installation.

Have you seen our famous one-piece built-in bath, the "Viceroy"? Manufacturing economies enable us to make it available for houses and apartments of all classes.

KOHLER CO. *Founded 1873* Kohler, Wis.

Boston	New York	Philadelphia	Pittsburgh	Atlanta
Detroit	Indianapolis	Chicago	St. Paul	St. Louis
Houston	San Francisco	Los Angeles	Seattle	London

**The star indicates the location of the KOHLER permanent trade-mark in faint blue.*

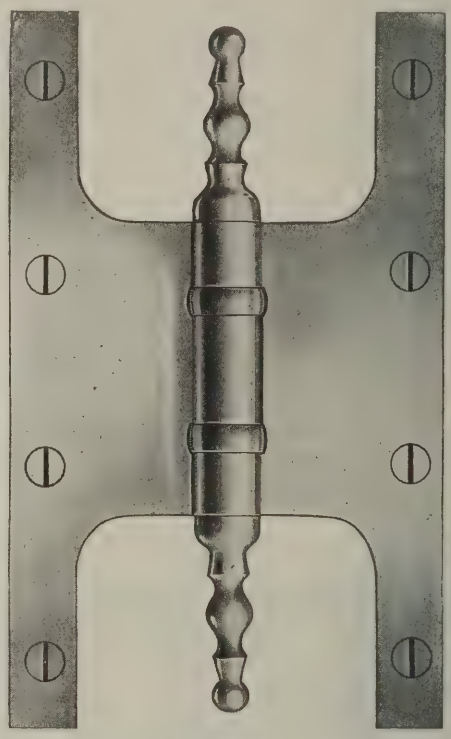


The "Viceroy." Plate V-14. (Patent applied for and name registered.)

has recently received an order from the American Sheet & Tin Plate Company, a subsidiary of the United States Steel Corporation, for 3000 squares of this new metal shingle, and at the same time we understand the shingle has received the endorsement of critical builders and architects throughout the country, and that it is rapidly growing in popularity.

Some New Stanley Goods

We take pleasure in calling attention to a recent addition to its already large line of ball bearing butts made by the Stanley Works, New Britain, Conn. It is a "Paumelle," which is French for hinge, and this design of butt, unlike most other types of builders



Some New Stanley Goods—Fig. 8—A "Paumelle"

hardware, originated abroad, hence the name. Because of the artistic effect of the barrel and the steeple tip, this type of butt, a view of which is shown in Fig. 8, is being used on doors of stock thickness. The gage of the metal and the strength of the butt are such that it is just as serviceable as the standard type of butts. It is made in two sizes, namely, 7½ x 3½ and 7½ x 4½. The dimensions are measured over all, first the length

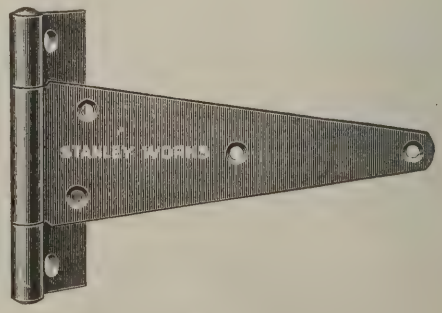


Fig. 9—Heavy T-Hinge

of the butt leaf and then the extreme width of the open "Paumelles." The butt is finished in all Standard Stanley Finishes, and is packed one pair in a box with screws. The point is made that the long leaves of the

(Continued on page 26)

Fire-Proof Doors

Metal and Metal Covered

Standard Sizes in Stock of All Designs

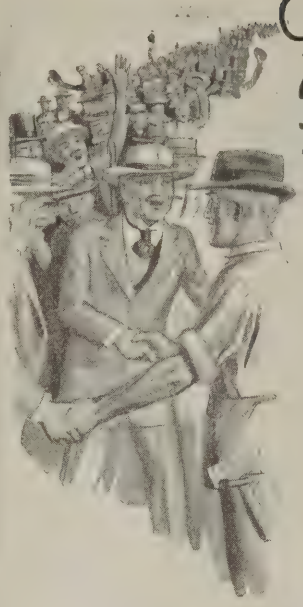
Agents Wanted

Write for Booklets and Price Lists—also our Agent's Proposition.



A. C. Chesley Co.
Incorporated
279 Rider Avenue
New York City, N. Y.

Owners of 20-year-old roofs



Get together and compare notes!

To the original cost of your roof —*labor and material*—add the cost for *repairs*. Divide this by the number of years of service.

You will find that RU-BER-OID costs less per year than imitations.

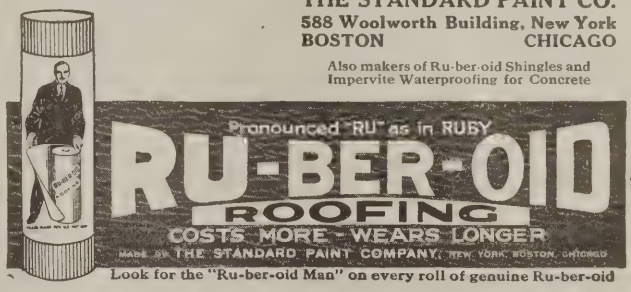
Genuine RU-BER-OID contains no tar, sand, wood fibre, paper. And in addition to being leak-proof, RU-BER-OID is also sparkproof, rustproof and rotproof.

Many RU-BER-OID roofs have not cost one cent for repairs since they were laid more than 20 years ago.

Made in Slate Gray, Tile Red and Copper Green. Your dealer will show you samples and quote you prices.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete



Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid

BOGALUSA BOGALUSA

"BOGALUSA" is the name *BY WHICH TO BUY* the BEST LONG-LEAF PINE THAT GROWS. (There's a difference.)

BOGALUSA is the name of the city where the best long-leaf pine that grows is cut into every size from great bridge timbers to little laths.

BOGALUSA, in lumber, is more than a name—it is a symbol of superiority and responsibility.

FOR ALL STRUCTURAL USES SPECIFY "BOGALUSA"—that is your guaranty. And if you don't find "BOGALUSA" stamped on EVERY PIECE or bundle *you'll refuse it* as "not per order."

WRITE US. (*Cutting 1,000,000 feet a day still leaves us time to take an interest in YOU.*) There's a *value* for you in the *Bogalusa Book*. (Free.) It's full of valuable pine statistics.

GREAT SOUTHERN Lumber Co., Dept. B, Bogalusa, La.
MEMBER SOUTHERN PINE ASSOCIATION

BOGALUSA BOGALUSA



HAMMER BRAND
Hand-Made Heart Cypress SHINGLES

The Shingles of our Grandfathers

Write for Booklet

The Hammer Lumber Co.
LIBERTY BUILDING, PHILADELPHIA
Member Philadelphia Wholesale Lumber Dealers' Association

Fiberlic

Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895

TRADE MARK

TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.

Owned and Operated by Nicholson File Company

butt are mortised into the jamb of the door and are made narrow for a light or French door.

One of the latest additions to the company's line of hardware for swinging garage doors is the heavy T-hinge with reverse pad, shown in Fig. 9. The point is made that this hinge is of such a nature that little time and labor are required in applying it, as only the jamb of the door is mortised, the door put in place, and the surface leaf applied to the face of the door. The hinge is made of extra heavy parts and is known as No. SC 963 JI, and is packed with screws one pair in a box. The complete set of hardware for a garage door consists of hinges, bolts, latches, hasps, door holders and handles. These reverse pad T hinges can be furnished in 10 in., 12 in., 14 in. and 16 in. sizes and are finished in dead black japan.



Fig. 10 — Stanley's Wrought Steel Handle

Still a third addition to its line of builders' hardware is the wrought-steel handle known as No. 482, illustrated in Fig. 10. It is made of cold-rolled wrought steel, rendering it exceedingly durable, and as it takes a beautiful finish its surface is said to be as smooth as glass and its edges clean cut. In appearance it makes a very attractive handle and insures for it a prominent place in connection with high grade work. It is 6½ in. long, 1¾ in. wide and is packed one dozen in a box with the necessary flat head screws. For outside work the company advises Stanley's sherardized and plated finishes.

Young's Band Saw Filing Machine

There is no doubt as to the importance of the position held by the band saw in all woodworking shops, and it is also a well recognized fact that unless the saw is properly filed, set, and the guides in fairly good condition, satisfactory work cannot be accomplished. A practical mechanic who has invented many useful machines based upon the results of his own observation and experience, has recently developed a band saw filing machine the use of which has brought great relief from band saw troubles. A general view of the machine is presented in Fig. 11, and the claim is made

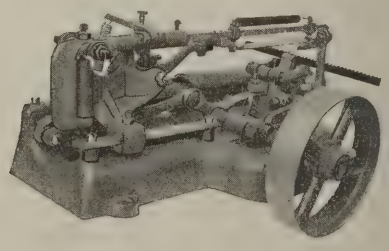


Fig. 11—Young's Band Saw Filing Machine

that it files eighty teeth per minute without help or attention. A 20-ft. band saw with four teeth to the inch, can, it is claimed, be accurately filed with this machine in less than 15 minutes, including the time for placing the saw in the machine and making the proper adjustments. It is being placed upon the market by Charles Young, York Harbor, Maine, who points out that the file does most of its work on the short or cutting side of the teeth where it requires but little metal to be filed from the saw in order to leave it perfectly sharp. The saw is set as low as possible in the vise and held rigidly while the file is doing its work. The saw is released while being fed ahead for the next tooth. The file holders are suspended from a universal joint situated on the rear of the reciprocating carriage, thus giving a free and easy

(*Continued on page* 28)


Showing Sun-Shade Attachment

Try This Aloe Level 10 DAYS—FREE

Easy Monthly Payments If You Buy

Prove the superior quality of the Aloe Convertible Level by testing it out for 10 days. Use it on your every day work laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning, shafting walls, piers, etc., for getting angles, or levels anywhere and the hundred and one other things for which you would use a level or transit. Then, if you decide to keep it, you may pay for it in easy monthly payments so small that you will scarcely feel them.

Aloe Convertible Level

is more than a mere level. It is a modified transit permitting double the range of work possible with an ordinary architect's level. Its construction is such that sights above or below the horizontal can be taken, making it the finest instrument ever offered at anywhere near the price. For taking vertical sights the instrument is provided with a special convertible bracket rigidly and permanently attached to the cross-bar thus eliminating the extra time that other instruments require for changing the telescope in position to take vertical readings. The telescope which is fitted with a permanent axis, rests in the bracket bearings and owing to our special constructed clips the instrument can be used for leveling while in this position if desired, although the bracket clips are easily and quickly released from the telescope axis when levels only are to be taken. The telescope is then set in its normal position in the wyes and you have overcome the old method of attaching and detaching the convertible bracket.

Your Own Time To Pay—No Interest

Remember, you are under no obligation whatever to keep the Aloe Convertible Level. We do not even ask you to promise to buy. But you owe it to yourself to see and try it. If it isn't all you expect you may return it at our expense. If you do keep it, you will find the small monthly payments easier than paying rent for an instrument—and at the end of a few months you will own it—absolutely. There's no red tape about this offer—we ask no embarrassing questions—everything is confidential—we charge no interest. You have practically your own time to pay.

Mail Coupon for Descriptive Circular

It explains the Aloe Convertible Level in detail and shows how easily the man without the training of the engineer or surveyor may secure the same accurate results as the expert. Send your name on coupon or postal for free copy and full particulars of our original, unique and popular selling plan.

A. S. ALOE CO., 625 Olive St., St. Louis, Mo.

Mail Coupon NOW

A. S. ALOE COMPANY,
625 Olive St., St. Louis, Mo.

Please send free descriptive circular about the Aloe Convertible Level and complete details of your easy payment plan. This request in no way obligates me.

Name.....

Occupation.....

City..... State.....



That Carborundum Niagara Grinder Puts New Life Into Any Edge Tools—

MY plane bit for instance was way off—needed grinding. On one corner of my work bench is the ever handy Carborundum Niagara Grinder. A few turns and the bit is sharp—you never saw a wheel that cuts so clean and quick as that Carborundum Wheel. Every Niagara Grinder has one. ¶ Then a couple of rubs on a Carborundum sharpening stone and my plane bit has a keen, smooth edge that will stand up on the job. ¶ That Carborundum Niagara Grinder is a dandy tool. Easy and smooth running—well made—durable—every one of you fellows should have one.

Ask your hardware dealer. Send for the Carborundum catalog.

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.



Compare Values

Gedney Farm Hotel,
White Plains, N. Y.
Kenneth M. Murchison, Architect

Compare values of roofing materials. You will find that on the big jobs the contractors have been careful to specify

Bayonne Roof and Deck Cloth

The reason is clear. They have found that Bayonne is always dependable. They know, too, that it is easier to lay than any other roofing material, and is more economical.

Laid on dry boards—painted afterwards. Fits smoothly into the corners, and can't buckle, crack or peel. It's absolutely weather and water-proof, adds to the appearance of the job, and wears like metal.

Recommended for roofs, sleeping-porches, conservatories, piazzas, and all places receiving constant wear.

Examine Samples in Book D

JOHN BOYLE & CO., Inc.
112-114 Duane St.; 70-72 Reade St., New York City
Branch House, 202-204 Market St., St. Louis, Mo.



"YANKEE"
Plain Screw Drivers
STANDARD No. 90
CABINET No. 95

They cannot loosen in the handle, in use or abuse.

You have our Guarantee.



They are durable as the high grade steel that composes them, and will render faithful service for generations. The comfortable handle and various lengths of blade make them suitable for all classes of work.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.
Lehigh Ave., Philadelphia, Pa.

action to the file which is pressed against the saw of a spring, the tension on every tooth, it is said, being exactly alike. As the file is held in holders by a spring, it is a very easy matter to change the sides of the file without changing its angle. The maker calls attention to the fact that it is a good scheme to change the sides of the file after filing four or five saws.

The Estate Single Register Heater

The attention which is being given at the present time to pipeless systems of heating renders of more than ordinary interest the construction which is being placed upon the market by the Estate Stove Company, 900 South Avenue, Hamilton, Ohio, and which is illustrated in general view in Fig. 12. It is known as the Estate Single Register Heater and is said to be of such a nature that it can be readily installed by any stove dealer. One large warm air register and two small intake registers

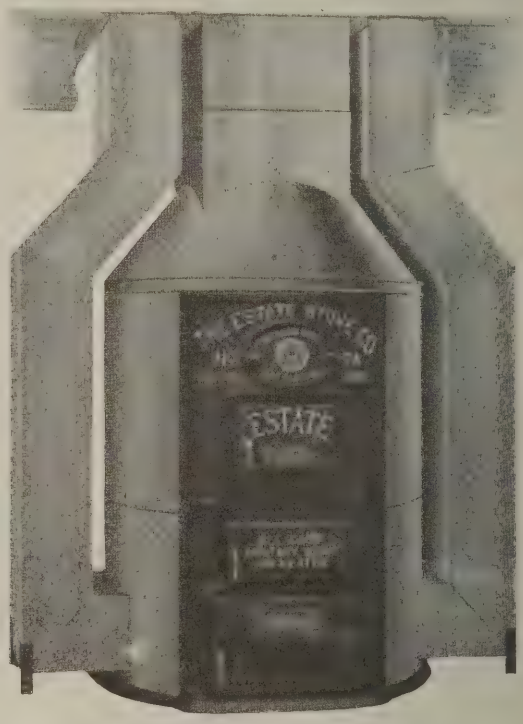


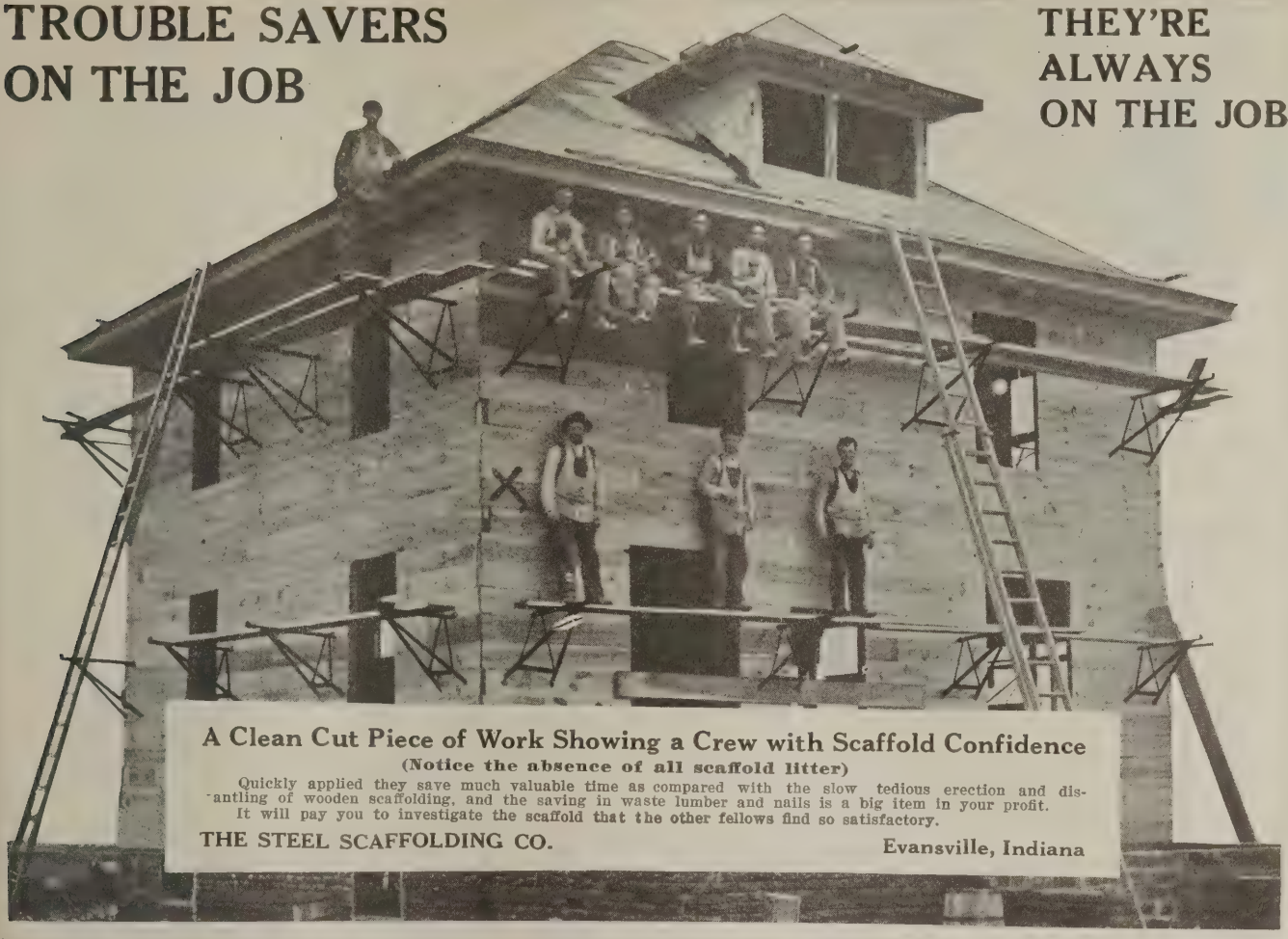
Fig. 12—The "Estate" Single Register He

are located in the floor of one of the downstairs rooms, so that the heated air is discharged through the warm air register rising directly to the ceiling of the room in which the register is located. The ceiling serves as a deflector, sending the heated air through open doorways into adjoining rooms. The cooler air is displaced and forced downward until it is drawn back into the furnace through the two intake registers. Here it is again heated and returned to repeat the same process of circulation. In this way, the company points out, warm air is kept constantly circulating "in a natural and easy manner making it possible to maintain uniform temperature in every part of the house." Among the advantages claimed for the Estate Single Register system is that it is possible to place one or both of the intake registers at a distance from the warm air discharge register—in an adjoining room or hall. In case of rooms which are shut off from the rest of the house to some extent, it is often desirable to do this. Still another advantage claimed for the heater is that a special warm air pipe can be run to any room of the house, thus making it possible to heat a bath room or any other room in which it is not practical to keep the doors open or to provide ceiling registers.

(*Continued on page* 30)

TROUBLE SAVERS ON THE JOB

THEY'RE ALWAYS ON THE JOB



A Clean Cut Piece of Work Showing a Crew with Scaffold Confidence

(Notice the absence of all scaffold litter)

Quickly applied they save much valuable time as compared with the slow tedious erection and dismantling of wooden scaffolding, and the saving in waste lumber and nails is a big item in your profit. It will pay you to investigate the scaffold that the other fellows find so satisfactory.

THE STEEL SCAFFOLDING CO. Evansville, Indiana

Are you with the big majority?

A recent canvass of hardware stores again verified the fact that by far the greatest number of saws sold to mechanics are

DISSTON SAWS

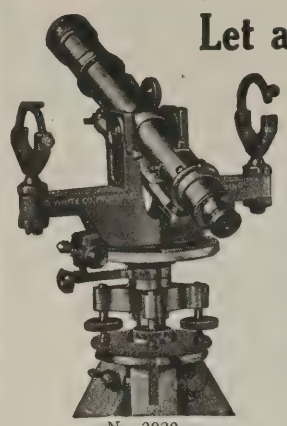


This means that most of the men who are in a position to **know**—whose reputation and success demand that they use the best—are using the saw that has been acknowledged best for more than three-quarters of a century. Are you one of these men?

As a mechanic, our Handbook S will interest you. Send for it, it's free.

Henry Disston & Sons, Inc., Philadelphia, U. S. A.

TRADE MARK REG. U.S. PAT. OFF.



No. 2020

Let a "White" Control Your Lines and Levels

Hundreds of contractors are letting a "White" convertible control lines and levels on their jobs. **They know a "White" can be relied on. They know a "White" convertible level is accurate, dependable, durable.** Why not profit by their experience and let a "White" control your lines and levels? **You'll never regret it.** Send for complete description and details of trial offer.

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN

Myers Wire Wall Ties

6 and 8 inches long.

For Veneer, Solid Brick and Concrete Work. Saves nails, time and labor, consequently money. If your dealer will not furnish our Ties, order from us and we will ship direct or order shipped to you from nearest dealer.

Send for samples and prices. 1000 *in a box.*

Patent Pending

For Veneer Work 3½ inches long

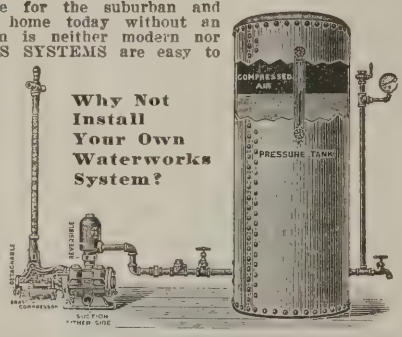
Saves 40 to 50 cts. per thousand on nails.

Mercer Mfg. Co., Mercer, Pa.

MYERS HYDRO-PNEUMATIC WATER SYSTEMS FOR EVERY HOME

A great convenience for the suburban and country residence. A home today without an adequate water system is neither modern nor complete. The MYERS SYSTEMS are easy to install and operate, require very little attention and give absolute satisfaction. Every contractor and builder should be familiar with Myers Domestic Water Supply Systems. Send your address to our Service Department and you will receive our new descriptive circulars for 1917.

F. E. MYERS & BRO.
355 Orange St.
Ashland, Ohio



The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞ weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-898 Progress St. Pittsburgh, Pa.

"Wonder" Quick Convertible Discharge Concrete Mixer

One of the very interesting exhibits at the recent Cement Show held in the Coliseum in Chicago, Ill., included a new "Wonder" Quick Convertible Discharge Concrete Mixer made by the Waterloo Cement Machinery Corporation, Waterloo, Iowa, and a general view of which is presented in Fig. 13. The construction of this machine is such that it can be changed from side discharge to end discharge or vice versa by two men in a space of time claimed to be less than ten



Fig. 13—"Wonder" Quick Convertible Discharge Concrete Mixer

minutes. The machine is mounted upon a truck, thus rendering it readily portable, the feature of convertibility adding but little to its weight. The point is made that the machine is in perfect balance on the turntable whether used as side or end discharge. The arrangement is such that the change in discharge is made without disturbing the trucks or moving it an inch in any direction. This is accomplished by merely removing four bolts in the turntable, which is mounted between the truck frame and the I-beam frame of the machine. After turning the mixer frame with the chute pointing to any one of the four sides on which it is desired to discharge, the bolts are replaced and securely tightened, thus rigidly bolting the mixer frame to the truck frame, when the machine is again ready for business.

Mottled Asphalt Shingles

Architects and home builders have long desired a roofing material that would combine as many elements of beauty and attractiveness as possible with fire-resisting qualities, durability, freedom from repair or renovation, ease of application and economy of cost. Asphalt shingles are said to have done much to accomplish these things, as they provided a standard size shingle covering which was low in price, and in other ways met the requirements of the case. The home builder has become familiar with asphalt shingles, and finds them quite satisfactory. There has, however, been some objection by the more artistic users to the "flat" colors which are prevalent. The dark red, the grayish green, and the pearl gray colors, it is said, display too much uniformity in a complete roof to please the eye of the discriminating architect or the builder who is looking for every distinctive touch which will make his work stand out from the rest in his community. These are superficial objections at best, but they indicate the existence of a desire for something to relieve the

(*Continued on page* 32)

A Sash Balance

that never needs attention

It's the Pullman

And it works with a lasting smoothness that only a perfect mechanism, well designed, can work.



Absolutely Noiseless

Nothing to stick, rattle or squeak. It is impossible to interfere with the action of the spring by squeezing the balance in a tight mortise. THE PULLMAN UNIT IS THE ONLY BALANCE HAVING THIS FEATURE. Satisfactory to owner and builder alike.

Over Six Million in Use

Ask for our plan of an arrangement we have evolved for dormer windows, triple windows and bay-windows which has met with wide approval among architects. It effects a considerable saving in construction, cuts down mullions to the minimum and in every way has given unqualified satisfaction.

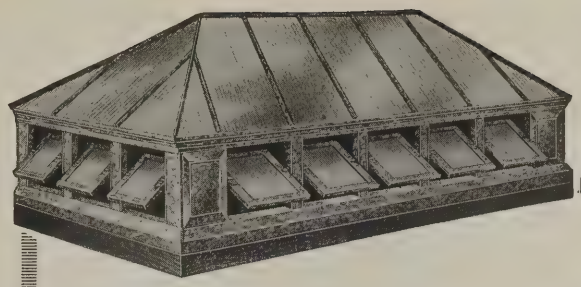
Guaranteed for Ten Years

Approved by the Underwriters Laboratories and may be used in fire-proof buildings. This is the only balance so approved.

Write for plan as above, prices and particulars.

PULLMAN MFG. COMPANY
8 Industrial Street Rochester, N. Y.

Pullmanize Your Windows



WHAT KIND OF SKYLIGHT ?

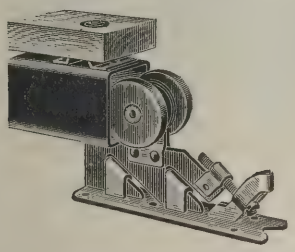
will you put on your next building? Will you take the first one you think of, without any idea of its durability or reputation for making good, or will you after careful consideration specify

WILLIS SKYLIGHTS

With a Willis you are backed by twenty-five years' experience in building dependable Skylights. They are easy to install, have lasting qualities, and are perfectly watertight without the use of putty. Largest possible glass area.

Write for Catalog illustrating these Skylights as well as our complete line of Sheet Metal building Materials. A valuable reference book for every Architect, Contractor and Builder.

WILLIS MFG. CO.
Dept. "A"
Galesburg Illinois



Convenience and the Modern Home

Every home builder strives to achieve convenience in arrangement. Doorways present a serious problem.

Richards-Wilcox Sliding Door Equipment

solves the problem. Doors hung on this equipment slide out of sight and out of the way, eliminate the danger of injury to little fingers, marring of furniture and kicking up of rugs. Permit proper lighting and ventilation—and they stay where they're put.

Roller and ball bearing make the doors slide easy. Fibre wheels and wood-lined track make them silent. Lateral and vertical adjustments of the hangers provide for settling and shrinking of building walls. Quality of material and workmanship insures long and satisfactory service. Adaptability of the line covers all conditions and requirements—"A Hanger for any Door That Slides."

Ask your hardware dealer. Write for catalog.

Richards-Wilcox Manufacturing Co.

SAN FRANCISCO LOS ANGELES NEW YORK CHICAGO — **AURORA, ILLINOIS, U.S.A.** — PHILADELPHIA MINNEAPOLIS BOSTON ST. LOUIS

Richards-Wilcox Canadian Co., Ltd., London, Ont.

"A Hanger for Any Door That Slides"



DIETZGEN Measuring Tapes

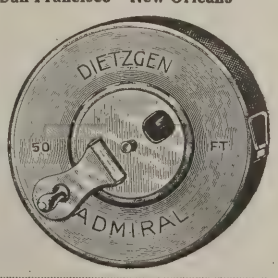
embody superior accuracy, dependability and perfect workmanship.

Leather cases are hand sewed and steel lined. Steel cases are heavy steel, with knurled band that insures firm grip.

The handles are easily opened, the division lines ***on upper edge of ribbon*** convenient to read, the simplified reading —foot number in front of each inch number—saves delays and mistakes.

EUGENE DIETZGEN CO.
Manufacturers
Chicago New York San Francisco New Orleans Pittsburgh Philadelphia

Tape Catalog "B" on request



The Reliance and Admiral Tapes are two of our popular sellers

COULSON CONSTRUCTION

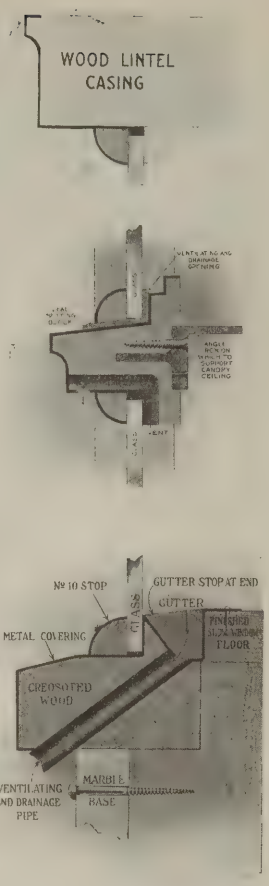
combines the best quality of material and workmanship, producing the most practical

STORE FRONT CONSTRUCTION

of superior design, and makes it possible to install a modern front at a nominal cost.

Write for catalogue containing full description and a number of designs of up-to-date fronts.

J. W. Coulson & Co.
107 W. Spring St.
COLUMBUS, OHIO



Vertical Section showing lintel casing covering, stop transom bar and bill.

You Need This Combination



Combined Level and Transit

For Architects Builders Contractors

For use as a level or for taking vertical sights.
Why pay for a surveyor's or engineer's transit when this instrument will take your angles?
The price is right.
Our exclusive feature: Patented one piece phosphor bronze axis, by means of which level is converted into a transit in a few seconds without screws needing adjusting.
Write for catalog of Convertible Level and our full line of drawing materials, etc.

New York Blue Print Paper Co.
102 Reade Street, New York



Patented Axis

monotony of solid colors, which inevitably reduce the "texture" a roof should have. With these thoughts in mind, the Flintkote Mfg. Company, Inc., 98 Pearl Street, Boston, Mass., has now produced a Mottled Asphalt Shingle, made by application of the red and green slate in varying proportions of color. There is no attempt to follow a design, as is sometimes done by roofers, when they lay alternate courses of different colors, or work out roof designs in color. The crushed slate is applied by a special "rig," which distributes it in a "hit-or-miss" effect that is beautiful in the completed shingles. It is intended that the roofer shall lay the shingles just as they are taken from the package, with no thought to match them or to form patterns in the roof. The completed effect of the whole roof will be heightened, the maker states, if this suggestion is carefully followed. The manufacturers will be glad to supply photographs reproduced in color, and literature describing the different styles in which the shingles are made.

Rogers Bros. All Steel Dump Trailer

Among the candidates for popular favor in the way of one-ton dump trailers for automobiles in which building contractors all over the country are likely to be interested is that made by Rogers Brothers Com-

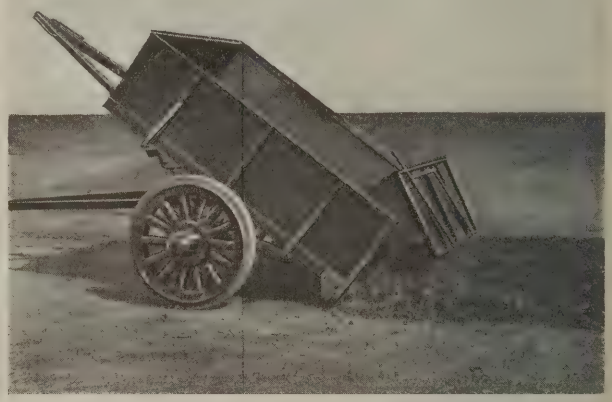


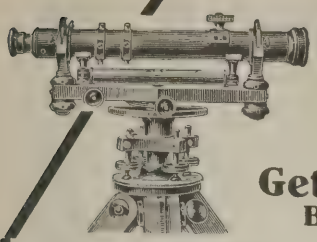
Fig. 14—Rogers Bros. All Steel Dump Trailer

pany, Albion, Pa., and a view of which is presented in Fig. 14 the picture showing the load dumped. The trailer is substantial in character, being constructed of 16-gage open-hearth steel reinforced with heavy angle irons. The body is 6 ft. long, 46 in. wide and 15½ in. deep, giving a capacity of 2000 lb. The wheels are of what is known as the artillery type, built of second growth hickory. The tires are 32 x 2 in. solid clincher and the coupler is of the ball and socket type, which is quickly detachable. The advantages resulting to contractors in all branches of the building trades from the use of motor trucks, trailers, and semi-trailers are becoming so self-evident to those who have given the matter even the slightest serious consideration that extended comment on this point would seem to be superfluous. The company above named has issued a variety of literature bearing upon the various models of trailers, which it manufactures, and any interested reader can secure copies upon application to the address given.

The Chesley Metal Covered Doors

The widespread tendency toward the use of fire resisting materials in connection with building construction, whether it be the impressive business structure or the modest dwelling, lends added interest to all

(*Continued on page* 34)



It's well worth

the small cost of a good Level to *know* your work is error-proof. A mistake may be costly.

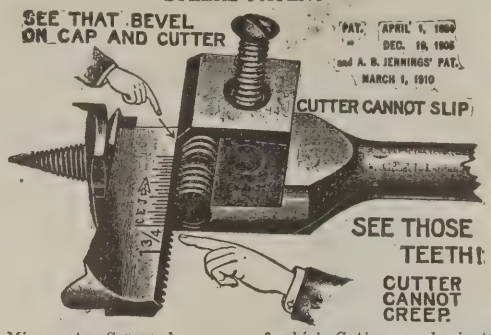
Get a KOLESCH Builders' Level

It isn't an expense—it's an investment—one that pays big.

Kolesch Levels are built right. They are light in weight, will stand hard usage and are reasonable in price.

KOLESCH & COMPANY
138 Fulton Street, NEW YORK

C. E. JENNINGS EXPANSIVE BIT
STEERS PATENT



Note Micrometer Screw, by means of which Cutter can be instantly adjusted to a Thousandth part of an inch.

C. E. JENNINGS & CO. *Sole Mfrs.* **71-73 Murray St., N. Y.**



Something For You

in our Pamphlet 29; viz.:

Valuable Tables for finding size of joist, safe load of joist, actual load on hanger, etc., etc.

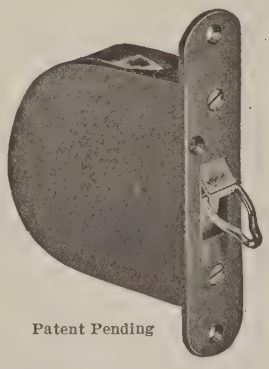
Some of these Tables are not in print elsewhere.

The Pamphlet and the Mounted Model Hanger will be mailed on request.

SOMETHING FOR US. We ask your special attention to items 5, 6, 7 on page 5 of the Pamphlet and to the matter on pages 23 and 24 relating thereto.

The W. J. Clark Co.
Salem, Ohio, U. S. A.

CALDWELL SASH BALANCES
UNIFORM MORTISES



Patent Pending

For use in all classes of new work

Box frames unnecessary

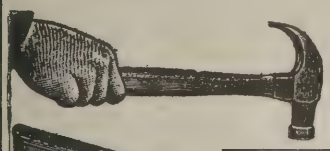
Mortises cut at mill reduce cost of installing. Counterbalance sashes at any given point. They outwear ordinary weights and cords. Unaffected by atmospheric conditions.

Cheapest method for modernizing old windows, as alterations in sashes and frames are not necessary. Sashes should be weighed before ordering.

Write for Circular

Caldwell Mfg. Company
5 Jones St., Rochester, N. Y.

Pearson's Automatic Shingle Nailer



Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

PAYS ITS COST ON ONE JOB



Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.

List price $7.00 (*but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars*).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools

COPPER CABLE SASH CHAIN



Thomas Morton
245 Centre Street
NEW YORK

COPPER CABLE
STEEL CABLE
CHAMPION METAL
STEEL CHAMPION

SASH CHAINS
CHAINS

For Suspending Heavy Doors Gates, Etc.

All of SUPERIOR QUALITY



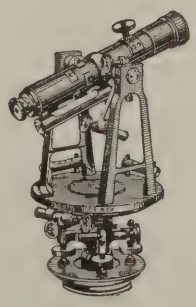
CHAMPION METAL SASH CHAIN

Think—

Wouldn't it be better for you to possess a Beckmann Architects' Level or Builders' Transit and have the satisfaction of knowing all lines, levels, angles and elevations are exactly correct?

And think of the time and trouble you save on all construction work! Beckmann Transits and Levels are the lowest price good instruments on the market.

Let us prove it to you. Send for Booklet D today.



No. 350

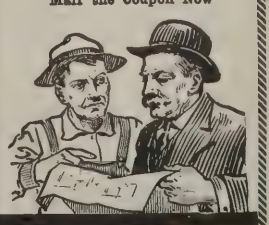
The L. Beckmann Company
Established 1874
300 Jackson St., Toledo, Ohio

We've helped hundreds of men in the Building Lines to the **Big Job** and the **Big Pay Envelope.** We can help **you.** Let us tell you how. A few dollars and your spare hours will do the job. Mail coupon today and get full particulars **free.**

CHICAGO TECHNICAL COLLEGE
Study at Home by Our New, Quick, Easy Plan

BUILDERS' COURSE in Plan Reading, Estimating, etc.

Mail the Coupon Now



CHICAGO TECHNICAL COLLEGE, 1020 Lake View Bldg., Chicago, Illinois

Gentlemen: I have marked with a cross (X) the branch or branches interesting me.

☐ Architectural Drafting	☐ Bldg. Superintendence
☐ Builders' Course	☐ Structural Drafting
☐ Estimating	☐ Structural Design
☐ Plan Reading	☐ Mechanical Drawing
☐ House Planning	☐ Machine Drafting
☐ General Contracting	☐ Machine Design

Name.....

Address.....

Town.....State.....

College or Home-Study Course.....



Ship Carpenters' Axe

Any ship carpenter who has ever used the White Axe never will use any other.

Why?

Wears longer. Less Sharpening. No Nicks.

Ask us for our nearest dealer's name.

The L. & I. J. White Co.
100 Perry Street
BUFFALO, N. Y.

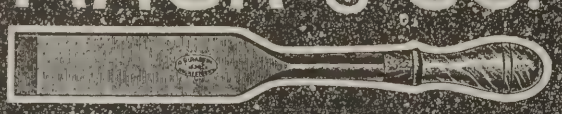
ORIGINATORS OF SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government** for over **30 Years.**



The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.

MACK & CO.



YOU will always feel secure when you use Barton Planes and Edge Tools. The making of keen edged tools that hold their sharpness is our hobby. If your dealer won't supply you we will.
There is some mighty interesting and profitable reading in "The Carpenter's Catalog" and "True Stories." Both free, of course.

Brown's Race & Platt St., Rochester, N.Y.

products which are calculated to prevent the spread of the flames at the time of a conflagration. Among such goods mention may be made of the metal covered doors that are being turned out by the A. C. Chesley Company, Inc., 279 Rider Avenue, New York City. These are stock doors of standard sizes and consist of a wood base covered with metal, no bolts, nails, rivets or screws being used in their construction. The claim is made that all the metal used has a non-corrosive coating, and the designs are such as to suit any condition using plain paneling or glass insertions. The variety is such as to give a great diversity of selection, and as the door is light, strong, substantially made and of attractive appearance, it cannot fail to appeal to the practical builder as well as to the architect and the prospective house owner. The company has a well equipped plant, enabling it to manufacture the Chesley stock doors at a minimum cost, and permitting them to be sold to the building trade, it is said, in competition with wooden doors. The company has issued a catalog, in which information regarding these doors is presented, and we understand that a copy can be obtained by any reader of the paper upon application to the address given above.

Vertical Sliding Solid Steel Window

A type of vertical sliding solid steel window, in the construction of which many of our readers may be interested, has been placed on the market by the Detroit Steel Products Co., Detroit, Mich., and is illustrated in Fig. 15. An angle iron is attached to the sliding se

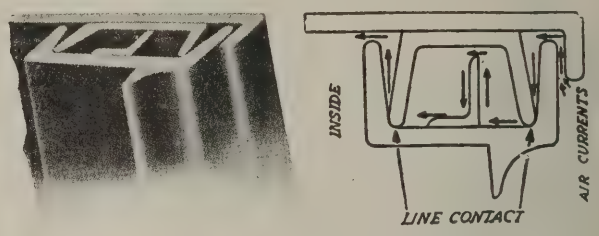


Fig. 15—Vertical Sliding Solid Steel Window

tion of the sash, protruding into the center of the channel guides. Line contact, it is pointed out, is thus secured between the web of the sash channel and the ends of the flanges of the guide channel and the ends of the angle on the sash and the web of the guide channel. With this arrangement the air currents are given ten different directions before they may finally gain entrance to the building. In addition to securing better weathering through this construction it is pointed out that the sash operates easily as friction is eliminated and the entire member is preserved and protected by paint which is not rubbed off. The two moving sections are counterbalanced to such an extent that 2 or 3 lb. of pressure is found to be all that is required to move a window of this type.

Metal Lath Makers Publicity Bureau Moves to Cleveland, Ohio

Announcement has been made by the Publicity Bureau of the Associated Metal Lath Manufacturers that its offices have been moved from Chicago, Ill., to Room 901, Swetland Building, Cleveland, Ohio, and that Zenas W. Carter, formerly of Boston, has been appointed Commissioner to supervise all its publicity, promotion and investigation from the Cleveland office. It is interesting to state that Mr. Carter has been manager for manufacturers' associations for the past ten years, and is therefore well qualified to discharge the duties of his new office. Among the plans of the Metal Lath Association which are yet in embryo is a co-operative national campaign of publicity which will

(Continued on page 36)



Every Partition Should Be Fireproof Construction

This illustration shows how this can be done. Such construction is the modern, safety-first idea properly carried out.

WRIGHT WIRE LATH

is noted for its strength, rigidity, and durability; its time, fire and water-defying qualities; the ease with which it is put up; the strong and even selvage which makes it easily handled and tied together.

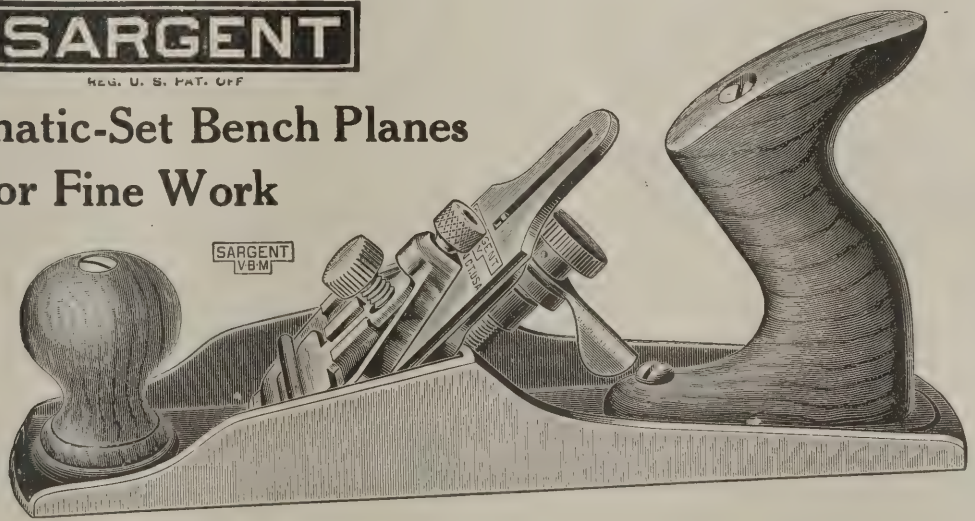
Can be used with either iron or wood furring. Plaster keys tightly through to the back side.

Send for booklet X. architect's service sheets, and further information.

WRIGHT WIRE CO.
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Automatic-Set Bench Planes Best for Fine Work



Sargent Automatic-Set Bench Planes are best by trial and by the recommendation of America's best mechanics. They will do work requiring a finer degree of accuracy than any other plane on the market.

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Write for free sample and interesting booklet.

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be developed by the Council of Advertising Managers of the member companies, which Council is an active part of the Publicity Bureau of the manufacturers' association although the Publicity Bureau proper includes officials and sales managers of the companies interested. Their plans cover a series of extensive and exhaustive tests of the fire resisting properties of metal lath; its use in fire retarding construction, the exploitation to architects and the public of the saving in space which can be effected through the use of this material; investigation and assistance in the revision of building codes of cities so that metal lath will receive its proper recognition by city officials and engineers, and a co-operative movement in the distributing centers of the United States seeking to develop co-operative promotion work on the part of the jobbers and large distributors of metal lath.

Magnesite for Building and Flooring Purposes

The Magnesite consumed in the United States during the year 1914 amounted to about 122,000 net tons calcined, and 13,000 short tons of crude, imported, and 11,293 short tons of raw, domestic, the total equivalent to about 132,000 short tons of calcined magnesite. Thus only 4 per cent of the Magnesite used in this country in 1914 was of domestic production. Nearly 93 per cent was imported from Austria and Hungary for making refractory bricks and other articles. The remaining 3 per cent was imported chiefly from Greece, either directly or through ports of Holland, Germany and England. The principal consumption is in the Eastern States, and is supplied by importation, whereas the entire domestic production comes from California and is used almost entirely on the west coast. Magnesite has been mined in California for a number of years in such small quantities, however, as not to have come to the attention of the consumers. Since imports of this material have dwindled to small quantities, it has been necessary for those who need magnesite in their manufacturing plants to encourage the production of this material wherever it has existed, and California has responded to the demand by shipping approximately 12,000 tons of magnesite monthly to the Eastern markets. This has gone mainly for refractory purposes, such as the making of brick and the lining of open hearth furnaces in the steel industry, and a very small portion has gone for building and flooring purposes. The small shipments to the East for these purposes have been chiefly made of material that has not been up to the standard for steel purposes. However, the continual mining and production from all the dependable mines in the State have brought the tonnage up to such an extent that the reliable producers are now looking for and are ready to fill any demands for Magnesite that may be made under the standard specifications which the material was always bought under from foreign sources. As there are such large quantities in California it is not difficult, if care is taken, to sort the material, so that it will be fit for practically any purpose that Magnesite has ever been used for in the past. It is merely a case of dealing with a responsible shipper. R. D. Adams, Humboldt Bank Building, San Francisco, Cal., has been shipping from 7000 to 10,000 tons monthly of California Magnesite for Eastern consumption mainly to the refractory trade. His production has been increased materially lately, and he is now in a position to meet demands outside of the refractory business, and has shipped some Magnesite to the flooring trade which will analyze, in the calcined state,

Magnesia	From 88 to 90%
Silica	Not over 6%
Lime	Not over 4%
Loss on ignition	About 2%

This class of material is pronounced to be very suitable for Magnesite flooring and stucco purposes.

(*Continued on page* 38)

We Want Every Architect and Builder to Know More About CLINTON MORTAR COLORS

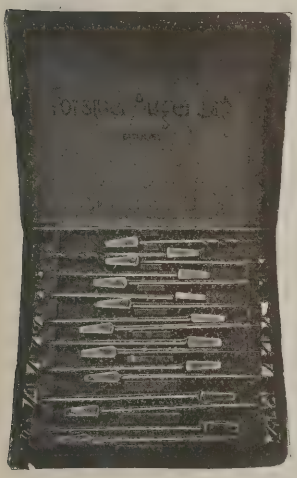
We want you to become better acquainted with these mortar colors and study the wonderful effects which may be obtained by mixing mortar with the proper shade of color.

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We will send to every interested architect and builder a set of samples showing the great coloring power and richness of tone of *Clinton Mortar Colors*, also some suggestions as to the proper colors to use to produce the desired effects.

A request for samples and prices puts you under no obligation to buy.

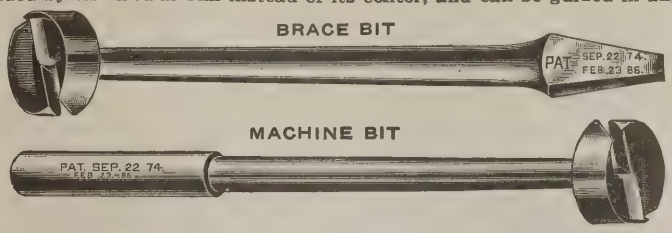
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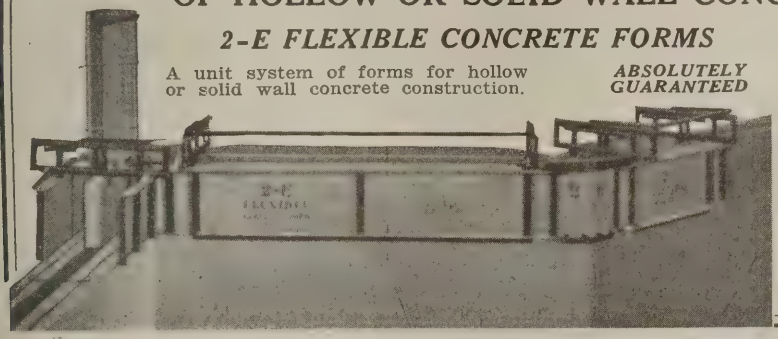
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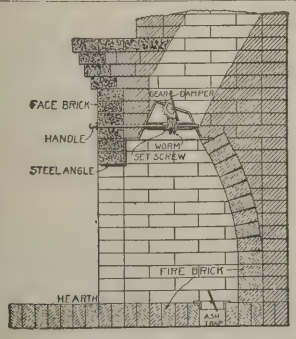


One operator can build as rapidly as three men can mix and carry the concrete to the form. There is no delay in waiting for the concrete to set.

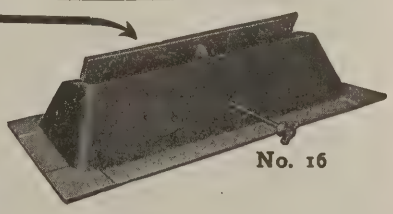
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Stover dampers make the building of fireplaces easy. The labor saved by their use reduces the cost considerably.

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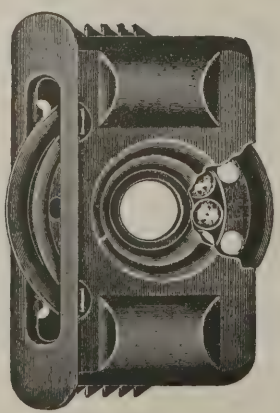
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Just ask for a sample shingle. See how tough, how pliable and how durable it is. See how it is made like a wooden shingle—thick at the butt and thin at the top. See how easy to lay it is. See what a beautiful roof it will make—red, green or slate black. Then you will understand why owners want the Winthrop when they know about it.

Winthrop Tapered Asphalt Shingles will enable you to get most of the roofs in your town. They win out with less argument than anything you ever tried to sell, for they look better than wood shingles and they have all the protection of asphalt.



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Frictionless, Noiseless, Everlasting.

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160 Eleventh Street, Grand Rapids, Mich.

Changes in Johns-Manville Personnel

J. D. Vail, former manager of the Salt Lake City office of the H. W. Johns-Manville Company, has been appointed manager of the Building Materials Department of that company's branch at Chicago. In the future the Salt Lake City office will be under the management of C. F. Cate. The Great Falls (Mont.) office will be managed independently of Salt Lake City by J. H. Roe.

Color Tones in Stucco

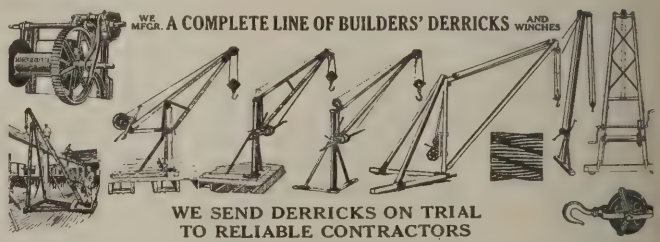
The present popularity of stucco is such as to cause any information concerning its variegated effects and construction to be of more than ordinary interest, and therefore the builder or architect will be likely to find valuable material in two *brochures* which are being distributed by the Atlas Portland Cement Company, 30 Broad Street, New York City. The one entitled "Color Tones in Stucco" contains ten full page colored plates showing the effects gained by the use of colored aggregates. Of special value to the builder are the pages devoted to specifications for stucco in color. The other, entitled "Information for Home Builders," contains general information of interest, and full page plates of houses in which Atlas White Cement was used.

The Universal Concrete Mixer

Attention has been called to the fact that the Universal Concrete Mixer placed upon the market this year by the Marsh-Capron Mfg. Company, 1462 Lumber Exchange Building, Chicago, Ill., has been attracting a great deal of attention on the part of contracting builders and others having occasion to do concrete work. This mixer is a low-charging machine and was brought out by the company to supply the demand for a one-bag mixer built in accordance with the other mixers made by it. Attention is called to the fact that the mixer especially adapts itself to the use of the busy contractor who does not want to fuss around separating bags of cement and that he will find in this direct-gear-driven machine a very satisfactory mixer. The statement is made that it is built in accordance with the standard specifications of the National Association of Mixer Manufacturers, is rated on the wet batch capacity at 7 cu. ft. and holds 11 cu. ft. of loose material. A catalog covering the full line of mixers turned out by the Marsh-Capron Company has been issued from the press and a copy will be sent to any building contractor who may be sufficiently interested to make application for it.

Catalog of Woodworking Machinery

A handsome catalog of 207 pages describing woodworking machinery has just been received from the Hercules Machine Company, the distributors being Machinery Merchants, Inc., 2070 Hudson Terminal, New York City. A more extended review of this catalog will appear in an early issue.



WE SEND DERRICKS ON TRIAL TO RELIABLE CONTRACTORS

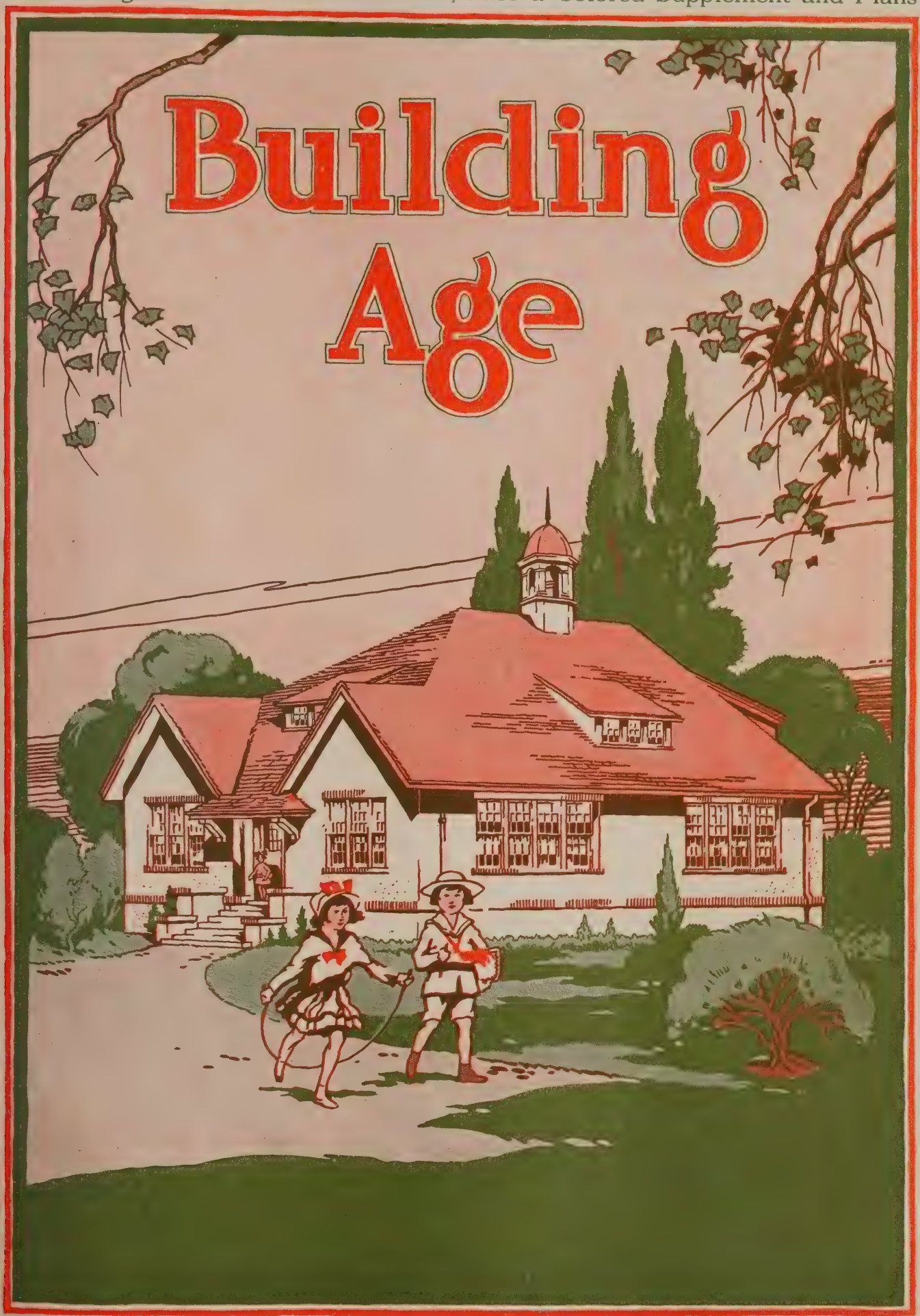
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Write for circular No. 12 with illustrations, descriptions and best prices on our complete line. The Sasgen Builders' Derricks are built of best Crucible Steel and Malleable Iron Fittings, which makes them light, strong, safe and durable. The derricks will please you and probably more than pay for themselves on the first job. Get one on trial.

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NEW YORK OFFICE—GRAND CENTRAL TERMINAL

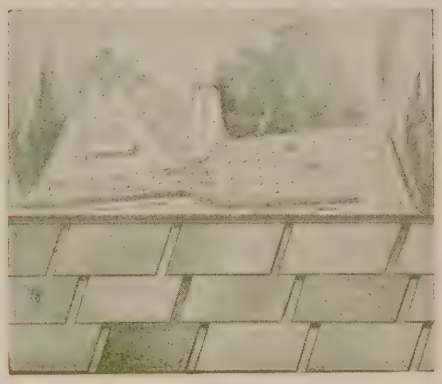
Containing Plans of This Schoolhouse; Also a Colored Supplement and Plans

Building Age



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This famous Coating comes in white and a variety of tints. It's sure cure for worn walls of brick, cement or stucco.

Write us. We'll send you Booklet No. 19—full of photos, facts and figures. Also a free sample of any tint you want.

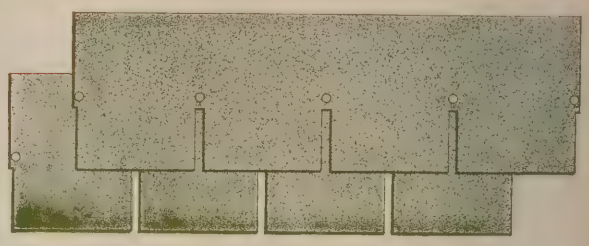
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Dealers who carry Rex Strip Shingles are fortunate in having an item which they buy at a consistently uniform price. They are able to protect their profit margins.

The Flintkote line is very interesting. It includes many quickly saleable specialties—all of them thoroughly practical.

We have a proposition to submit. It is just as interesting to the user as to the dealer. Let us send our General Catalog No. 20, which describes and illustrates twenty-three Rex Products. It also gives valuable information about all kinds of roofing materials. It states clearly and completely our sales policy. It will be sent free on request.

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98 Pearl Street, Boston, Mass.

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The Building Age

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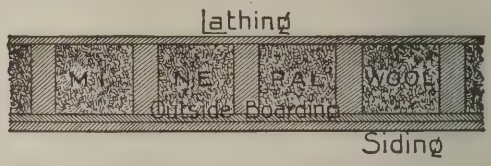
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Section of Outside Wall of House, Showing Wool Between Studding.

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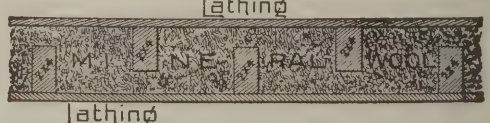
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BUILDING AGE

NEW YORK, JUNE, 1917



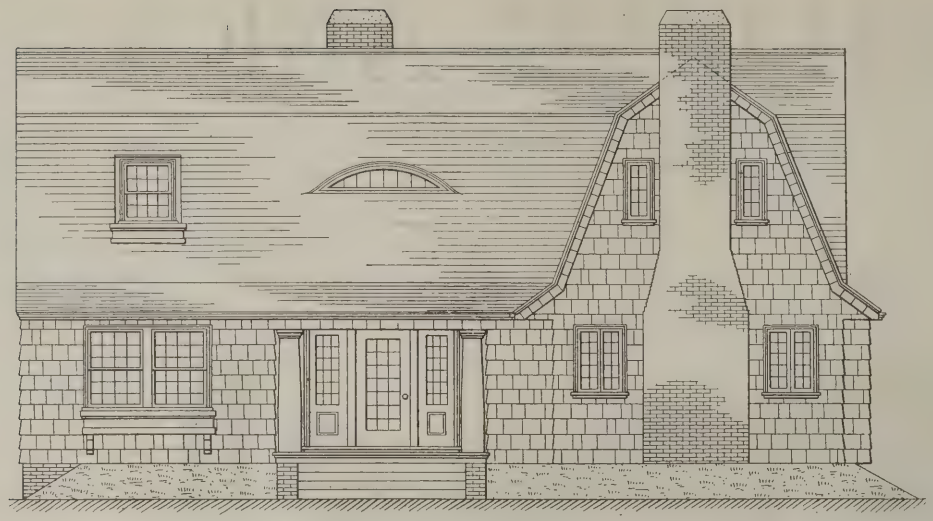
EXTERIOR VIEW OF THE HOUSE BUILT FOR MR. A. L. SOPER AT MANOR PARK, LAKEWOOD, OHIO

A FINE EXAMPLE OF SUBURBAN HOME

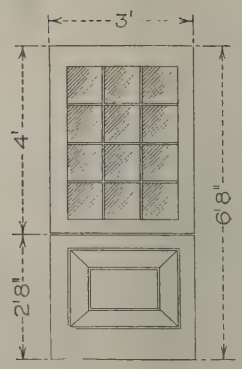
MANY STRIKING FEATURES OF EXTERIOR TREATMENT—A WELL CONCEIVED PLAN ARRANGEMENT

WITH the crowded and congested condition of the major portion of our larger cities, the natural tendency of the business man is to seek the suburbs as a place of residence and enjoy the many delightful features of environment and physical comfort resulting therefrom. This tendency is clearly demonstrated in the thousands of attractive suburban homes which are to be found in every section of the country and this number is increasing by leaps and bounds every year. A most attractive example of this class of dwelling and one which will doubtless receive more than passing attention on the part of builders and home seekers among the readers of the BUILDING AGE is illustrated herewith. Its external treatment is such as to produce unique effects, noticeable features being the gambrel roof with its eyebrow and sunken dormer windows; the shingled sides and gables; the outside chimney judiciously placed to give a bold and striking appearance; the recessed main entrance with its convenient wooden bench, and the ample window illumination with the small panes of glass to be found on all sides.

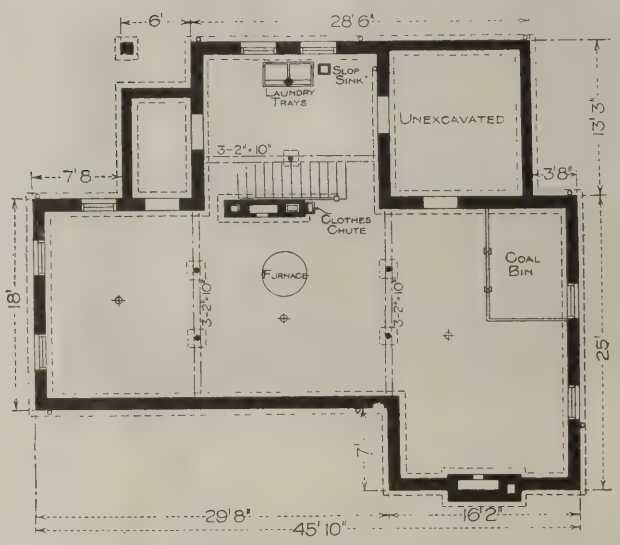
Interiorly, the house is even more striking and novel in its layout. From the recessed porch one enters a reception hall with coat closet conveniently placed at the right of the entrance door. The feature of the hall is the open fireplace with the cozy corner at the left and the grandfather's clock at the right, the effect produced being illustrated in one of the half-tone pictures here shown. At the right of the hall is the living room with open fireplace at the front and extension window at the right. A view looking toward the open fireplace is found among the pictures accompanying this article. Beyond the living room is the library reached from the



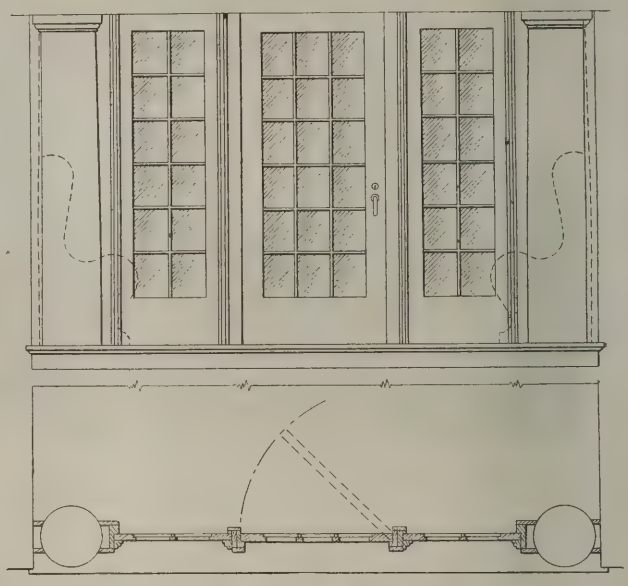
Front Elevation, Showing Recessed Entrance and Outside Chimney—Scale 3/32 In. to the Foot



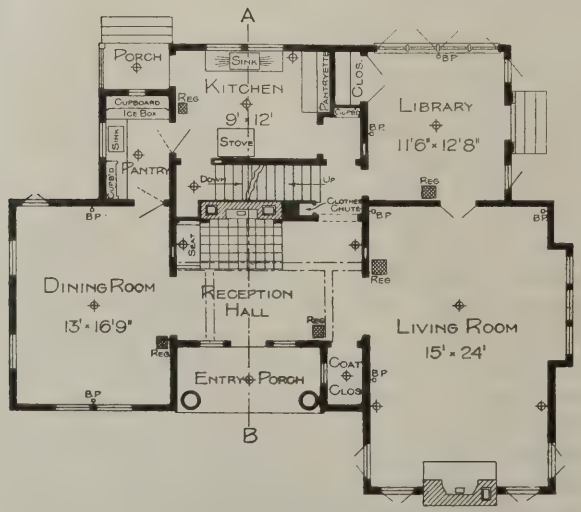
Elevation of "Dutch" Door—Scale ¼ In. to the Foot



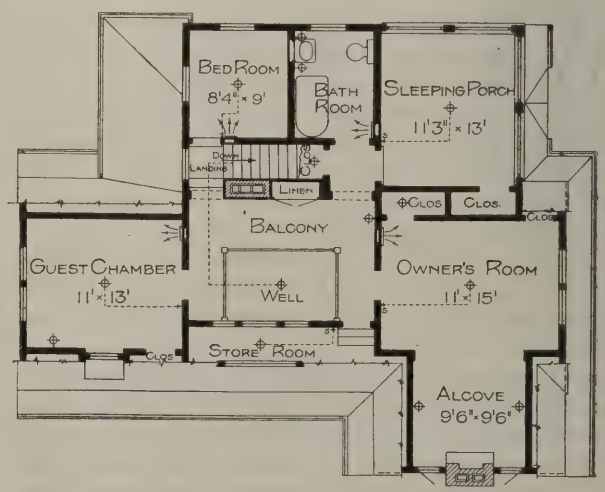
Foundation—Scale 1/16 In. to the Foot



Elevation and Section of the Storm Sash—Scale ¼ In. to the Foot



First Floor—Scale 1/16 In. to the Foot



Second Floor—Scale 1/16 In. to the Foot

outside by a door in the right hand wall and amply lighted by windows on two sides. A commodious



DETAIL OF FRONT ENTRANCE AND SHOWING THE OUTSIDE CHIMNEY

one of the pictures which constitute an attractive feature of this article. Beyond the dining room is the pantry fitted with sink, ice box and various cupboards and beyond it, in turn, is the kitchen. This also is fitted with sink placed under the double window and against the rear wall where ample light is afforded. From the kitchen lead the stairs to the cellar, these being placed directly under the main flight. The latter stairs are placed just beyond the chimney of the reception hall fireplace and are convenient to the reception hall, the library and the kitchen, the position being such that they can be used by the domestic without being visible from the living room or dining room.

An interesting feature of the reception hall is its height, extending as it does through two stories as clearly indicated upon the floor plans. On the second floor the well is surrounded by a balcony from which all the rooms on that floor may be easily reached. The owner's or master's room occupies a large space over the living room and with its alcove secures opportunity for an open fireplace directly over the one on the floor below. The left hand front corner of the house is occupied by the guest chamber. At the rear of the house is a bed room, the bath room and a commodious sleeping

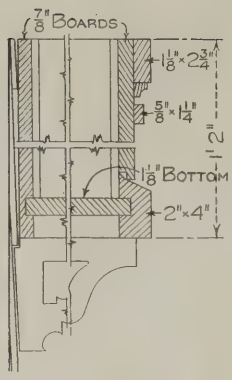


THE RECEPTION HALL LOOKING TOWARD THE OPEN FIREPLACE AND SEAT WITH FRENCH DOORS TO THE DINING ROOM AT THE LEFT

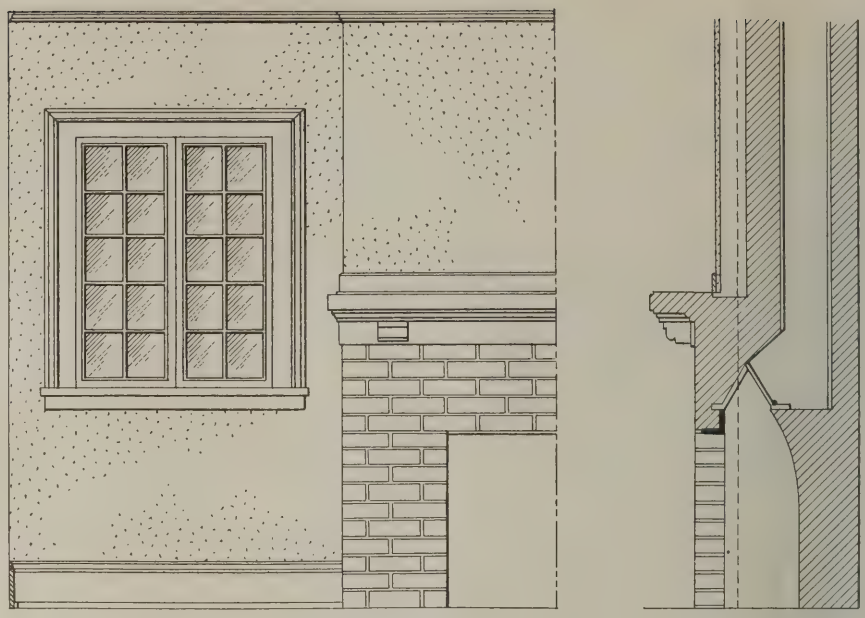
closet is one of the features of this room.

At the left of the reception hall is the dining room, an interior view of which is also afforded by

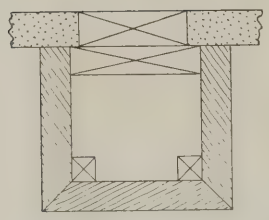
porch. Immediately outside the door of the bathroom is a closet and opening from the balcony is another for the linen.



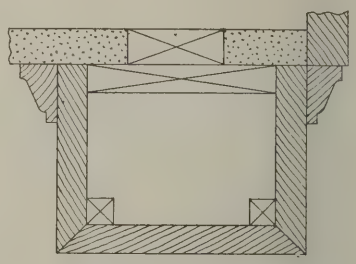
Section of Flower Box on First Floor—Scale 1 In. to the Foot



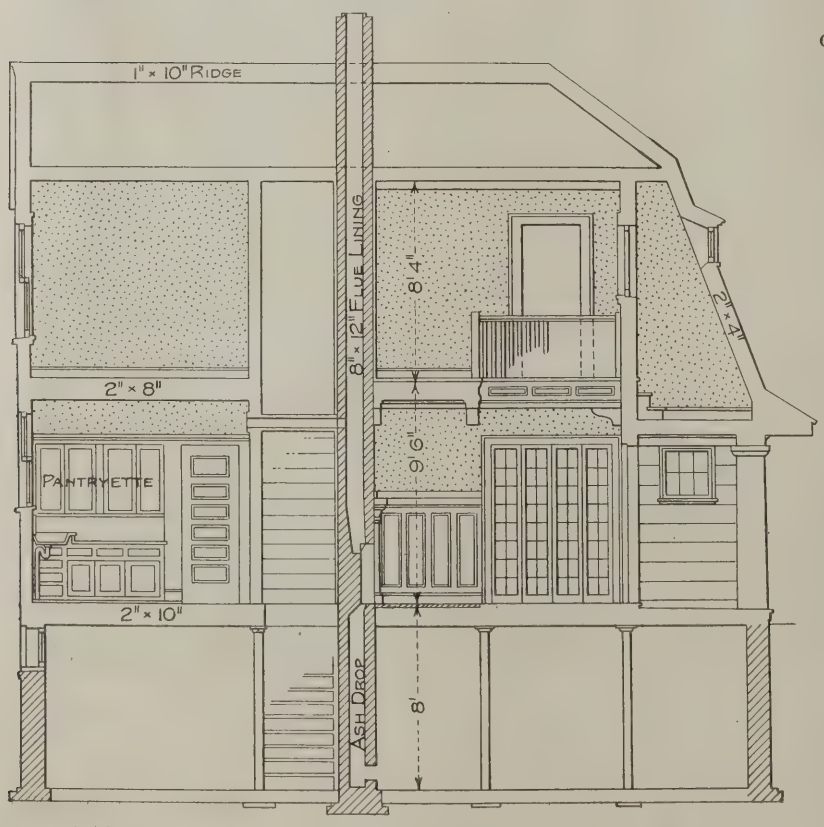
Partial Elevation of Fireplace End of the Living Room with Section Through the Fireplace—Scale 3/8 In. to the Foot



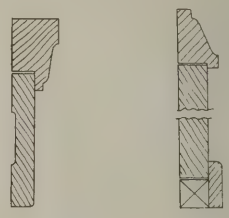
Cross Section of Ceiling Beam of Upper Hall—Scale 3 In. to the Foot



Cross Section of Ceiling Beam in Lower Hall—Scale 3 In. to the Foot

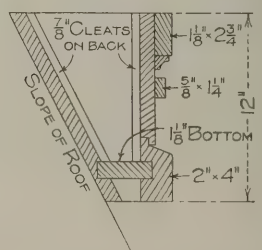


Vertical Cross Section Through the House on the Line A-B of the First Floor Plan—Scale 1/8 In. to the Foot



Head Casing Base

Scale 3 In. to the Foot



Section of Flower Box on Second Floor — Scale 1 In. to the Foot

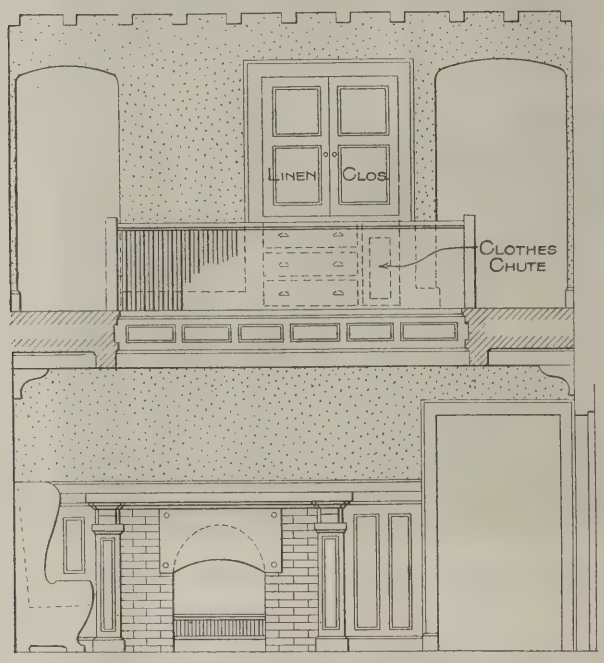


VIEW IN THE LIVING ROOM, LOOKING TOWARD THE FIREPLACE AT THE FRONT



A PORTION OF THE DINING ROOM AS VIEWED FROM THE RECEPTION HALL

The house faces west and occupies a lot measuring 75 x 200 ft. in area. The foundation walls 12 in. thick, are of hollow tile, and the outside steps as shown in the pictures are of rough cut shale brick. The framing timbers are of yellow pine, the beams of which there are three being 2 x 10 in., the mud sills as well as first and second floor joists are



Vertical Section Through the Main Hall—Scale 3/16 In. to the Foot

the weather while the roof was covered with 16 in. Creo-Dipt shingles exposed 4½ in. to the weather and stained a moss green.

The exterior finish is of cypress and the interior finish is of birch. The floors are double, the finish floors being ⅞ x 2¼ in. selected plain sawn oak. No building felt was placed between the finish floor and the sub-floor owing to the fact that the basement ceiling is plastered with two-coat work.

The doors are of the six-panel Colonial type with French or casement doors between the hall, the living-room, the dining room and the library.

The interior woodwork is finished in white enamel including the doors and the finish floors are waxed.

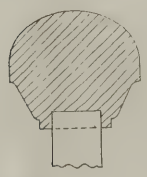
The plumbing is of the modern type, the bath room being fitted with pedestal lavatory of vitreous china, a "Si-wel-clo" closet and a "Viceroy" tub with Speakman shower. The foundation for the tile floor in the bathroom was 3 in. of cement grout. The floor has a cove base. A No. 9 Hoffman heater supplies hot water.

The house is wired for electricity and piped for gas, the kitchen stove being connected to use natural gas as a fuel.

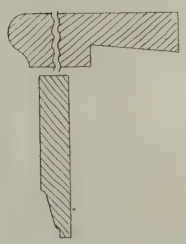
The house is heated by a hot water heating plant with a Scientific gas heater.

Vacuum cleaner pipes are also installed with outlets at the first floor for the purpose of accommodating the "Tuec" vacuum cleaner system.

The details which are presented on the several pages afford the builder an excellent idea of the manner in which the construction is arranged while

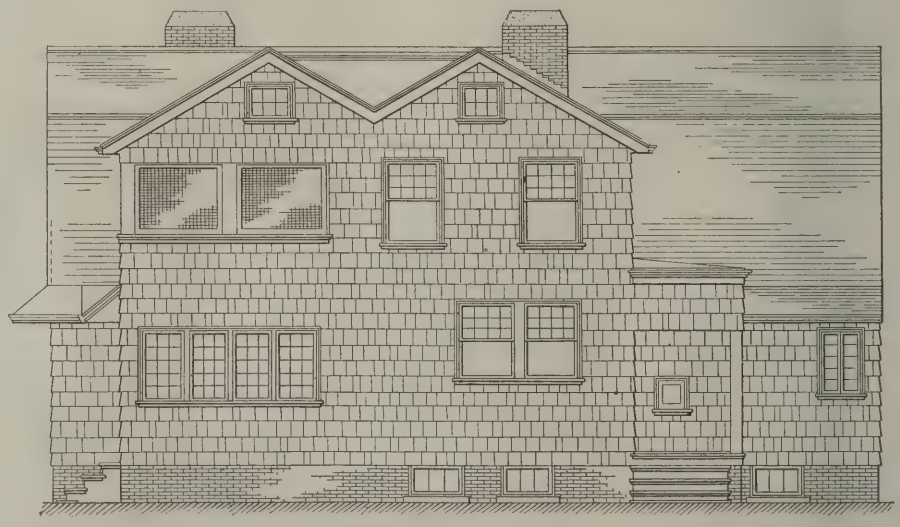


Section of Hand Railing



Window Stool and Apron

Scale 3 In. to the Foot



Rear Elevation of the House, Showing Sleeping Porch on Second Floor—Scale 3/32 In. to the Foot

2 x 8 in., the attic joists are 2 x 6 in., the ceiling joists, rafters, collar ties, plates and studs are 2 x 4 in. and the ridge 1 x 6 in.

The exterior frame was covered with sheathing board put on horizontally and over these were placed a layer of heavy waterproof building paper. This in turn was covered with 24 in. Creo-Dipt shingles treated with "Dixie White" and exposed 10 in. to

the half-tone engravings show the appearance of the finished work.

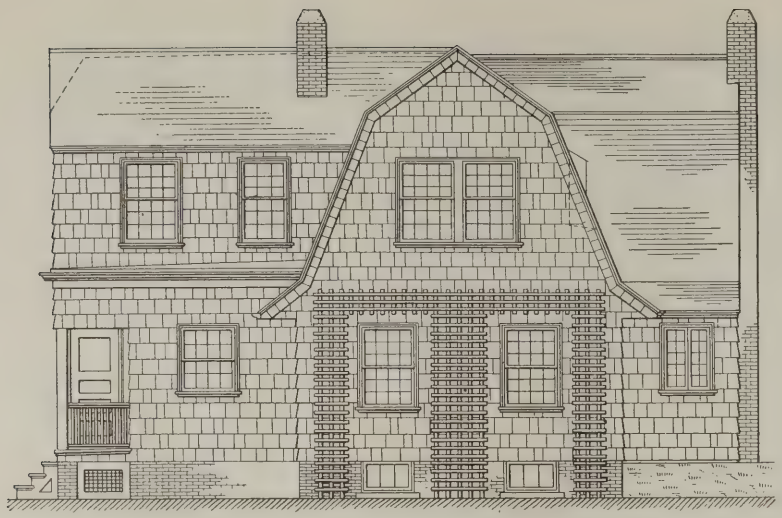
The Dutch Colonial suburban home here illustrated and described was erected in Manor Park, Lakewood, Ohio, in accordance with plans prepared by the John Henry Newson Company, Williamson Building, Cleveland, Ohio, and the work was executed under their supervision.



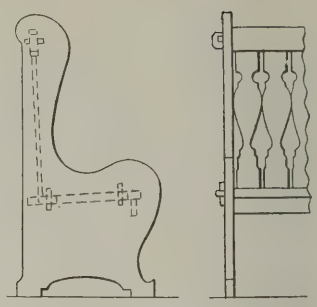
VIEW LOOKING INTO ALCOVE OF OWNER'S BED ROOM, SHOWING OPEN FIRE PLACE



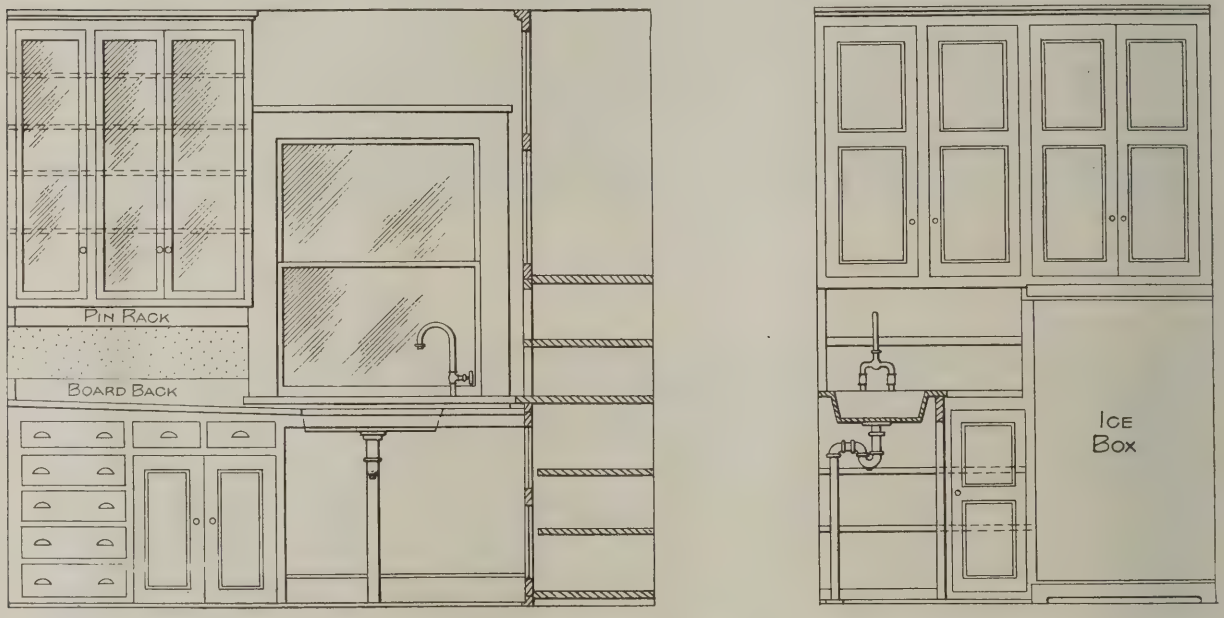
LIBRARY, SHOWING OUTSIDE DOOR AND THOSE TO THE LIVING ROOM AT THE RIGHT



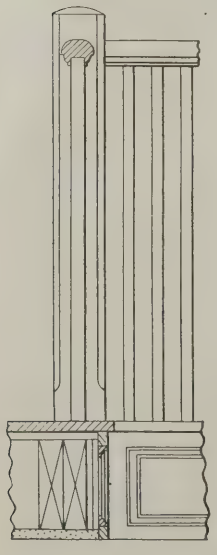
Left Side Elevation Showing Trellis Around Dining Room Windows—Scale 3/32 In. to the Foot



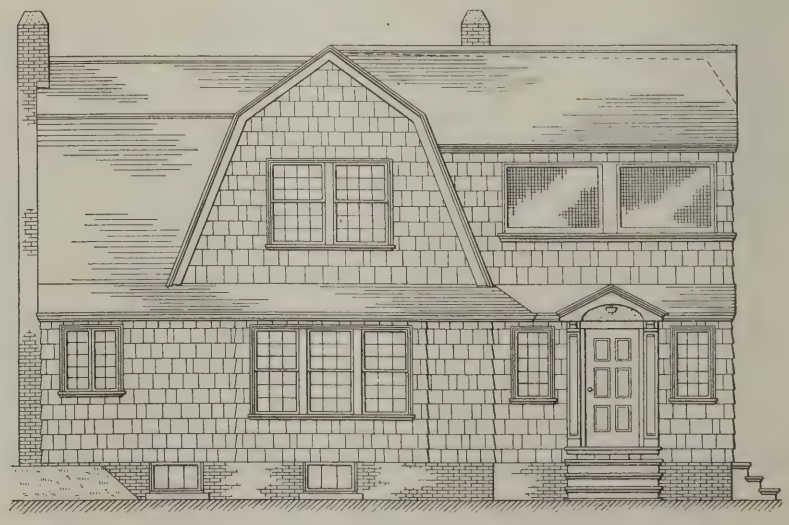
Details of Porch Seat or Bench—Scale ⅜ In. to the Foot



Elevations and Sections of the Cupboards in the Pantry—Scale ⅜ In. to the Foot



Detail of Newel Post—Scale ¾ In to the Foot



Right Side Elevation Showing Outside Door to Library—Scale 3/32 In. to the Foot

SCHOOLHOUSE FOR THE RURAL DISTRICTS

AN INTERESTING ACCOUNT OF THE WAY ONE COMMUNITY SECURED A NEW SCHOOLHOUSE

BY LAWRENCE S. KEIR

AT the present time more attention is being given to rural school buildings than ever before. The little red or white schoolhouse in which we acquired the rudiments of our early education may have seemed perfectly satisfactory to our parents, but surely we did not find them just what we thought they should have been, and are not willing that the children of the present generation shall be housed all day in rooms that are poorly heated, ventilated and lighted. The little old schoolhouse under the hill is doomed, and in many parts of the country is being condemned as fast as the authorities find it practical to do so. Its place is being taken by modern, roomy, well-lighted and properly ventilated buildings which are in many cases one-room affairs, although sometimes they have two or more classrooms, these being as up to date and comfortable as the classrooms in the large city schools.

Many communities contemplate building a new schoolhouse, but are not just certain what they will require, nor just how to go about it. The local carpenter could often secure these jobs if he understood, and could explain to the people, just what the authorities required in the new building. For this reason it may be of interest to explain how the people of Cragsmoor, Ulster County, N. Y., went about the building of the schoolhouse which is shown in the picture and details presented herewith.

For several years the people of Cragsmoor had talked of a new school building, as the old one was in very bad condition, so the school trustees sent to Albany for a copy of the school laws. After these had been carefully read postal cards were sent to each taxpayer in the district stating that a meeting would be called two weeks later to decide on the building of a new schoolhouse. At the same time notices were posted in conspicuous places.

When the meeting was held the vote was in favor of the new building, and one of the trustees wrote to the School Commissioner asking for the regulations governing new schoolhouse construction. In reply the commissioner sent a small plate drawing, shown herewith, together with a copy of the printed regulations. In regard to halls, doors, stairways, staircases, etc., the regulations were as follows:



THE COUNTRY SCHOOLHOUSE IN THE DEPTH OF WINTER

1. All schoolhouses for which plans and detailed statements shall be filed and approved, as required by the preceding section, shall have all halls, doors, stairways, seats, passageways and aisles and all lighting and heating appliances and apparatus arranged to facilitate egress and afford adequate protection in cases of fire or accident.

2. All exit doors shall open outwardly, and shall, if double doors be used, be fastened with movable bolts operated simultaneously by one handle from the inner face of the door.

3. No staircase shall be constructed with winder steps in lieu of a platform, but shall be constructed with straight runs, changes in direction being made by platforms. No door shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such doorway.

The plans were to be submitted on paper not more than 36 inches wide, and show in detail the ventilation, heating and lighting of the building. The specifications were to contain a statement requiring the contractor to guarantee that the system of heat and ventilation described would heat the rooms to a temperature of 70 deg. in zero weather and provide at least 30 cu. ft. of pure air every minute for each pupil to be accommodated in each study or classroom.

The heat flues should be of sufficient capacity to furnish the required amount of heated air at a velocity of from 300 to 400 ft. per minute, according to conditions.

At least 15 sq. ft. of floor space and 200 cu. ft. of air space for each pupil to be accommodated in each study or recitation room must be provided. In this connection it was necessary not only to state the size of the rooms (length, breadth and height) but also to give the number of individual desks to be placed in the room.

The plans and specifications must clearly show that proper provision is made in all respects "to facilitate egress in cases of fire or accident and to afford requisite and proper accommodations for public protection in such cases." In buildings of any considerable size, fireproof construction is recommended. Where this is impracticable it is recommended that the basement and stairways should be fireproof. The following extracts from the regulations are of interest in this connection, although the entire recommendations do not apply to the small schoolhouse here described.

The windows in all study rooms and recitation rooms should be so arranged that the main light will come from the pupils' left. If necessary to have more window space, the supplemental light should come from the rear, but no window should be placed in the rear directly opposite the teacher's desk. The windows should be grouped together as nearly as possible on the pupils' left so that the light may be massed, thereby furnishing a comparatively even distribution of light and minimizing areas of light and shadow. The windows should extend as near to the ceiling as the principles of construction will admit and should be without transoms or unnecessary framework. In study and recitation rooms, one pane of glass to a sash is recommended; under no circumstances should there be more than four. Any considerable area on the side to the left of the pupils that is without window surface should be opposite the space in front or in the rear of the pupils' desks. The ratio of window surface to floor surface should as a rule be one to five. If the main light comes from the north or from a side of the building which is much shaded, the ratio should be one to four.

In grade rooms or study rooms, the aisles should run the long way of the room.

Platforms should be used only in study halls.

In the construction of stairways, the risers should be not more than 6½ in. and the treads not less than 11 in. The stairways should be sufficiently broad to insure the ready passage of all pupils who may have occasion to use them at any time.

If grade and classrooms are entered by a single door, it should be located near the teacher's desk; if entered by two doors, one of these should be located near the teacher's desk and the other at the opposite end.

In the primary grades, the blackboards should be placed approximately 26 in. from the floor; in the intermediate grades, 30 in.; and in the grammar grades, 36 in. Each blackboard should be provided with a trough at the bottom, which should have an open woven wire cover on hinges.

Ample cloakrooms should be provided. These should be thoroughly heated and ventilated.

School buildings should be fitted for the use of the stereopticon as a means of class instruction. Wherever electricity is available, each classroom and assembly room should be provided with suitable wiring for carrying a current of at least 15 amperes. Twice this load should be provided for in an assembly hall, and even more if the room is a large one. The plug receptacles should be placed at the back of the room in the floor or in the base board. For darkening the room, heavy black, opaque window shades are required These shades should not run in grooves or other devices, but should hang as do any other shades and overlap the window casing three or four inches.

It is recommended that provision be made in building specifications for securing the best decorative effects. Picture molding if not placed in the cove should divide spaces into pleasing proportions. Over blackboards, it should be placed about one-quarter of the distance from the ceiling to the blackboard. Registers, thermostats, clock, etc., ought not to be so placed as to break up spaces suitable for hanging pictures. Light gray-green or drab is recommended as a wall color for southern exposure and light cream or buff for northern exposure. The dado should be a darker tone of the wall color, and the ceiling white very slightly modified by the wall color.

If the closets are located in the basement, the closet for each sex must be approached by a separate stairway. The rooms must be well lighted and heated and the toilets must be thoroughly ventilated. The ventilation must be entirely independent of the ventilation of the schoolrooms. One seat should be provided for every 25 boys and one for every 15 girls. One urinal should be allowed for every 15 boys. Both seats and urinals should be separated into compartments. Absorbent or corrosive materials cannot be approved for use in the construction of urinals.

The trustee was a carpenter, and after talking the matter over with the mason and plumber he decided that for a new schoolhouse with new equipment, and with the necessary grading, the cost at that time would not exceed $3,500. Another meeting was called, at which a committee was elected to have plans drawn, award the contracts, and superintend the work, the committee being authorized to spend not more than $3,500. One of the committee then made a pencil drawing of the proposed building and sent it to the inspector's office for his comment. When this was returned the regular plan and specifications were drawn up.

The original drawing and one set of specifications, together with one tracing, were then sent to the commissioner, who signed them and forwarded them to the inspector at Albany. Here the original drawing was placed on file and the tracing and specifications returned to the trustee with a certificate of approval. It should be stated that the plans as approved did not have the stairway leading to the cellar as here shown. Instead, the chimney was in the center line of the building and the girls' and the boys' halls were alike. The building was planned with no direct access to the cellar from the classroom, as it was intended that the fires should be looked after by a janitor. However, after the building was under way it was deemed advisable to have some channel of reaching the cellar without leaving the building, in case it might at times be more convenient to do so. The arrangement shown is somewhat of a makeshift, and should not be copied, although as it is seldom used it answers well enough in this instance. It will be noticed that the stair door opens into the room, this being necessary to avoid danger of any one being pushed through the doorway and down the stairs.

Though not shown on the plans, there is a gable built at the back of the chimney to shed the water from behind it. Valleys and chimney flashing are of sheet copper.

There is no cement bottom on the cellar, so that the trenches under the foundation wall were partly filled with small stones to act as a drain and carry water away from the cellar. All the foundation work is laid in Portland cement mortar.

The walls back of the wainscoting are covered

with Sackett's plaster board, while all other walls are plastered with Ivory wood-fiber plaster, the cellar ceiling having one double coat darbied true and even. All other walls are finished with lime and plaster of paris, hard finish. The specifications called for all finished walls to be ½ in. thick of plaster.

All rough lumber is No. 1 hemlock; the joists, studding and ceiling beams to be spaced 16 in. on centers; all openings and corners are double framed, and double studs are used in the window mullions. One double row of cross bridging is used between each joist bearing and a solid block bridging is run around between the outside studding 6 ft. or 6½ ft. above the floor line, as conditions require, so as to stiffen the studs and also act as nailers for the wainscot cap in the halls and for the molding at the top of the blackboard.

The show rafters are yellow pine, and the projection is sheaved over with ⅞-in. yellow pine No. 2 flooring. The rest of the roof and the sides of the building are covered with ⅞ x 8 in. yellow pine shiplap.

A porch floor is laid with 1⅛-in. No. 1 yellow pine floor with painted joints. The outside door and window casings are 1⅛ x 5-in white pine.

The roof is covered with waterproof paper on which are laid Cortright's galvanized-metal shingles. The sides of the schoolhouse are covered with heavy building paper, over which are laid 18-in. red cedar shingles which were dipped in brown shingle stain before laying, and were brush-coated afterward.

The cellar door and windows have plank frames. The cellar sash are arranged to slide without weights and are fitted with spring-bolt fasteners. All sash are glazed with double-thick American glass.

The flooring is of ⅞ x 3-in. comb-grain yellow pine. The wainscoting is ⅞-in. beaded yellow pine. The door jambs are ⅞-in. white pine and window jambs 1⅛-in. white pine.

All inside doors are of Washington fir, of the five-panel type, 1⅜ in. thick. The outside doors are 1¾ in. thick, with cross panels. The front door is glazed with American plate glass. The blackboards are of the best grade of slate.

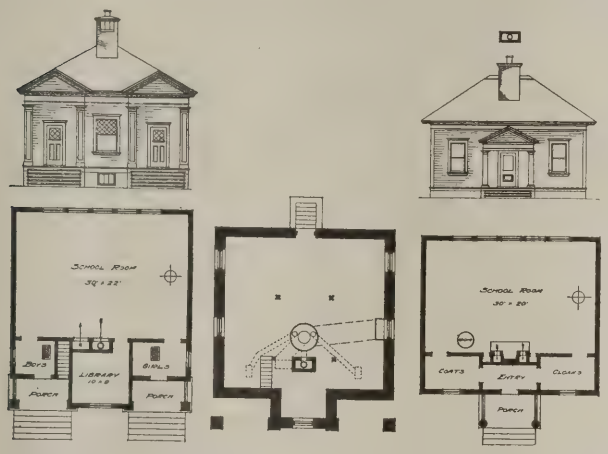
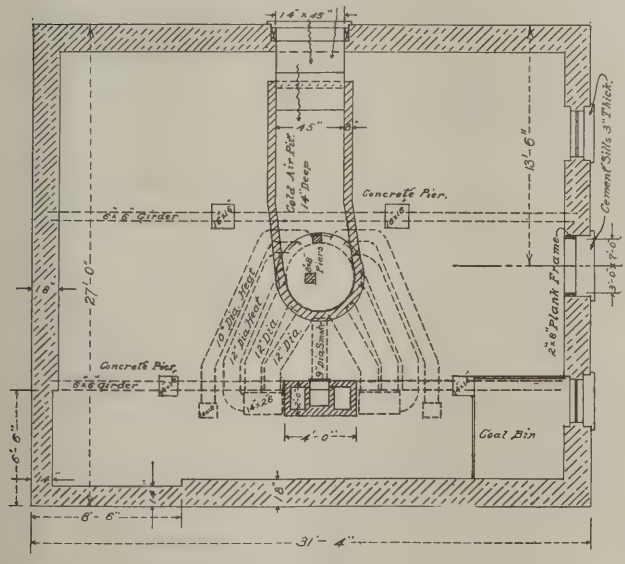
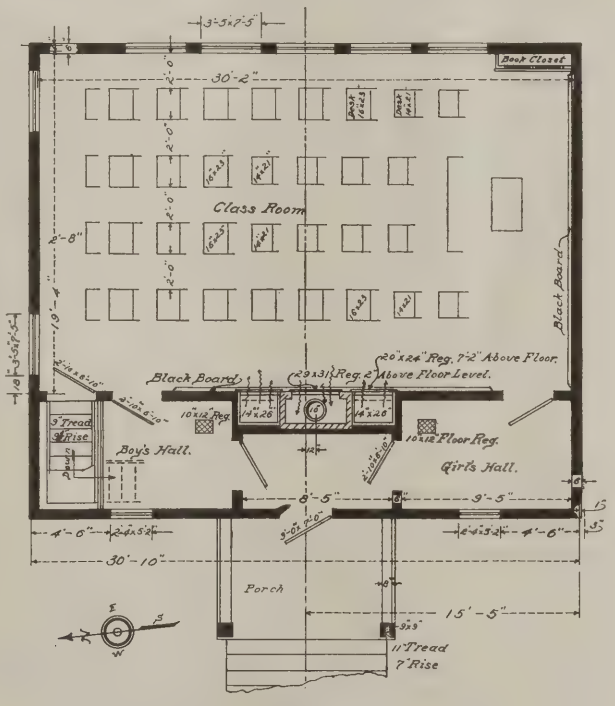


Plate Drawing Furnished by the State School Commissioner



Basement Plan Showing Heater and Pipe Arrangement



Main Floor Plan—Scale 3/32 In. to the Foot

PLANS OF THE SCHOOLHOUSE DESIGNED FOR THE RURAL DISTRICTS

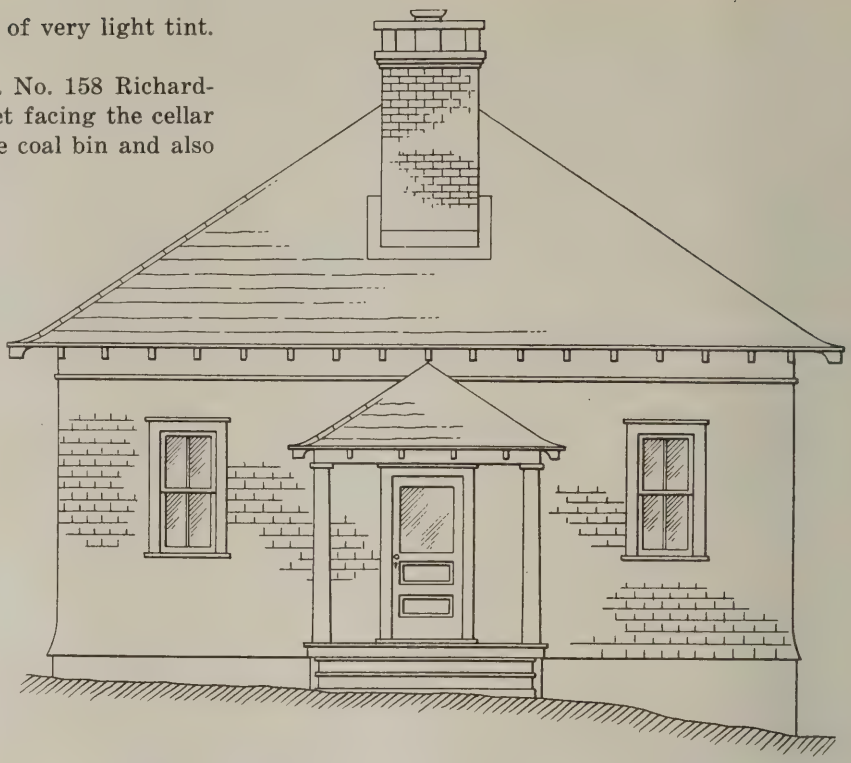
The outside woodwork, excepting the shingles, was given three coats of lead and oil paint. The porch floor was painted gray and the rest of the painted work was a light cream, which, with the brown shingle stain, gives a pleasing combination.

The interior trim was finished with wood filler and varnish, and the floors with hard oil. The side walls of the classroom were tinted a light buff, the space between the upper picture molding and the ceiling being tinted a little darker than the rest

of the wall, while the ceiling was of very light tint. The halls were left white.

The schoolhouse is heated by a No. 158 Richardson & Boynton hot-air furnace set facing the cellar door so as to be convenient to the coal bin and also in a good light.

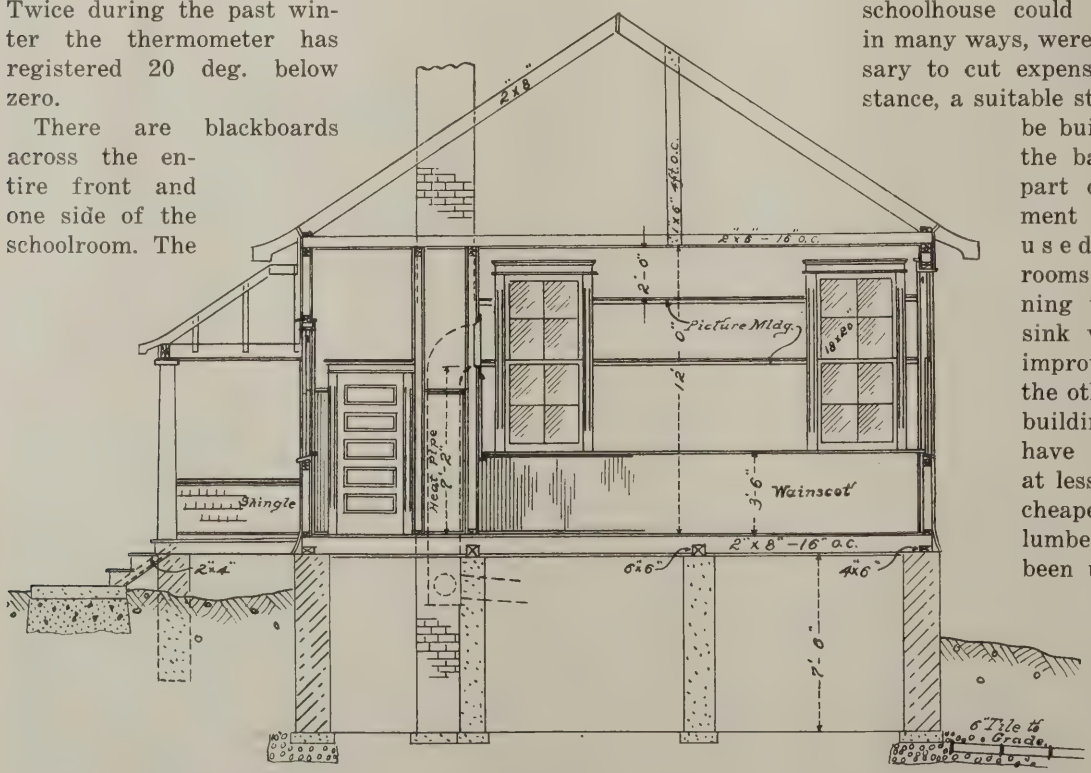
Before the building was commenced there was considerable speculation as to what it was going to cost to run a furnace large enough to supply the 900 cu. ft. of pure air per minute that the law required and also to heat the building up to 70 deg. in zero weather. In fact, there was more protesting against what some of the people considered a waste of good money and heat than on any other point raised. It seemed almost impossible to bring some of the people to believe in plenty of fresh air in the schoolroom. These people seemed to have the idea that the State was imposing a hardship on the town by compelling them to heat the schoolroom and then force the heat up the chimney, whereas, if the heat was only kept in the room a much smaller furnace would supply the necessary warmth. However, all protesting has disappeared now that the people have seen the practical working of the system, and find that the furnace can be run on an average of one ton of coal a month with the thermometer registering 10 and even more degrees below zero part of the time. Twice during the past winter the thermometer has registered 20 deg. below zero.



FRONT ELEVATION—SCALE ⅛ IN. TO THE FOOT

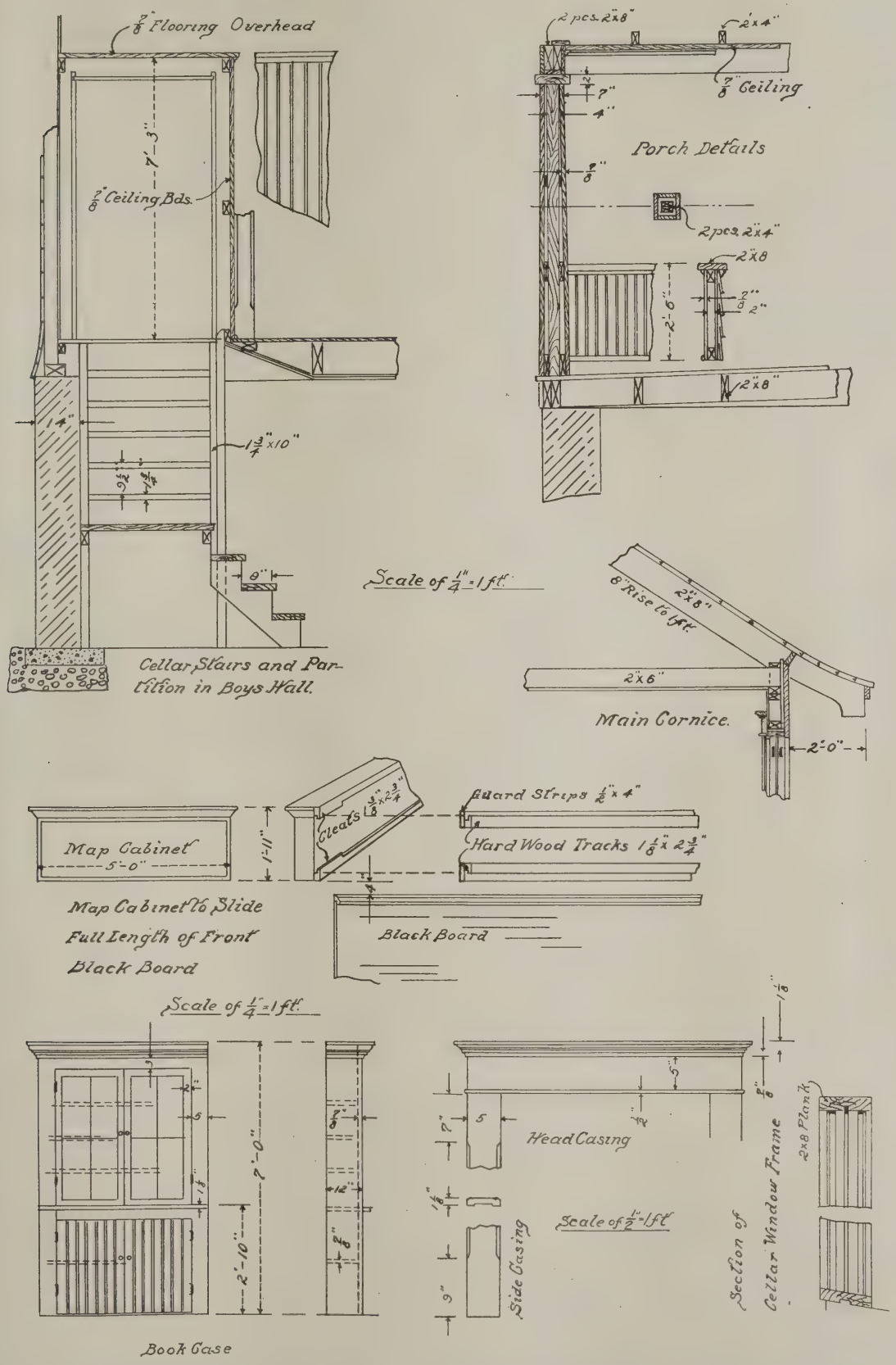
There are blackboards across the entire front and one side of the schoolroom. The other side is taken up with windows and bookcase. There is, however, no suitable wall space for maps, and this was overcome by the use of a map case, the maps being arranged inside on shade rollers so that they could be drawn down when wanted. The map case was hung in grooved tracks just over the front blackboard, so that the map could be slid to any point along the front of the room that was most convenient.

It is well understood that this schoolhouse could be improved in many ways, were it not necessary to cut expenses. For instance, a suitable stairway could be built leading to the basement, and part of the basement could be used for toilet rooms; also running water and a sink would be an improvement. On the other hand, the building could have been erected at less expense. A cheaper grade of lumber could have been used and the



VERTICAL CROSS SECTION OF THE SCHOOL BUILDING—SCALE ⅛ IN. TO THE FOOT

wainscoting could have been omitted. It could have been heated with a ventilating stove instead of furnace, and then the basement would have been unnecessary. Without a basement, of course, a double floor would have been required, but the plastering of the basement ceiling would about balance that item.



MISCELLANEOUS CONSTRUCTIVE DETAILS OF THE RURAL SCHOOLHOUSE

Estimate of Cost

The cost of the building together with the prices paid for labor and the more important of the build-

ing materials used in the work was as follows:*

Excavating	$60.00
Stone and concrete work	290.00
Carpentry on main building and setting furniture	1,321.00
Plastering and chimney	100.00
Painting	50.00
Privies and fence	50.00
Heating	320.00
Blackboards	26.00
Furniture and maps	110.00
Shades	12.50
	$2339.50

The cost of grading is not included in the above, but $25 or $30 should put the grounds in good shape. The architect's charges are not given.

Scale of Wages

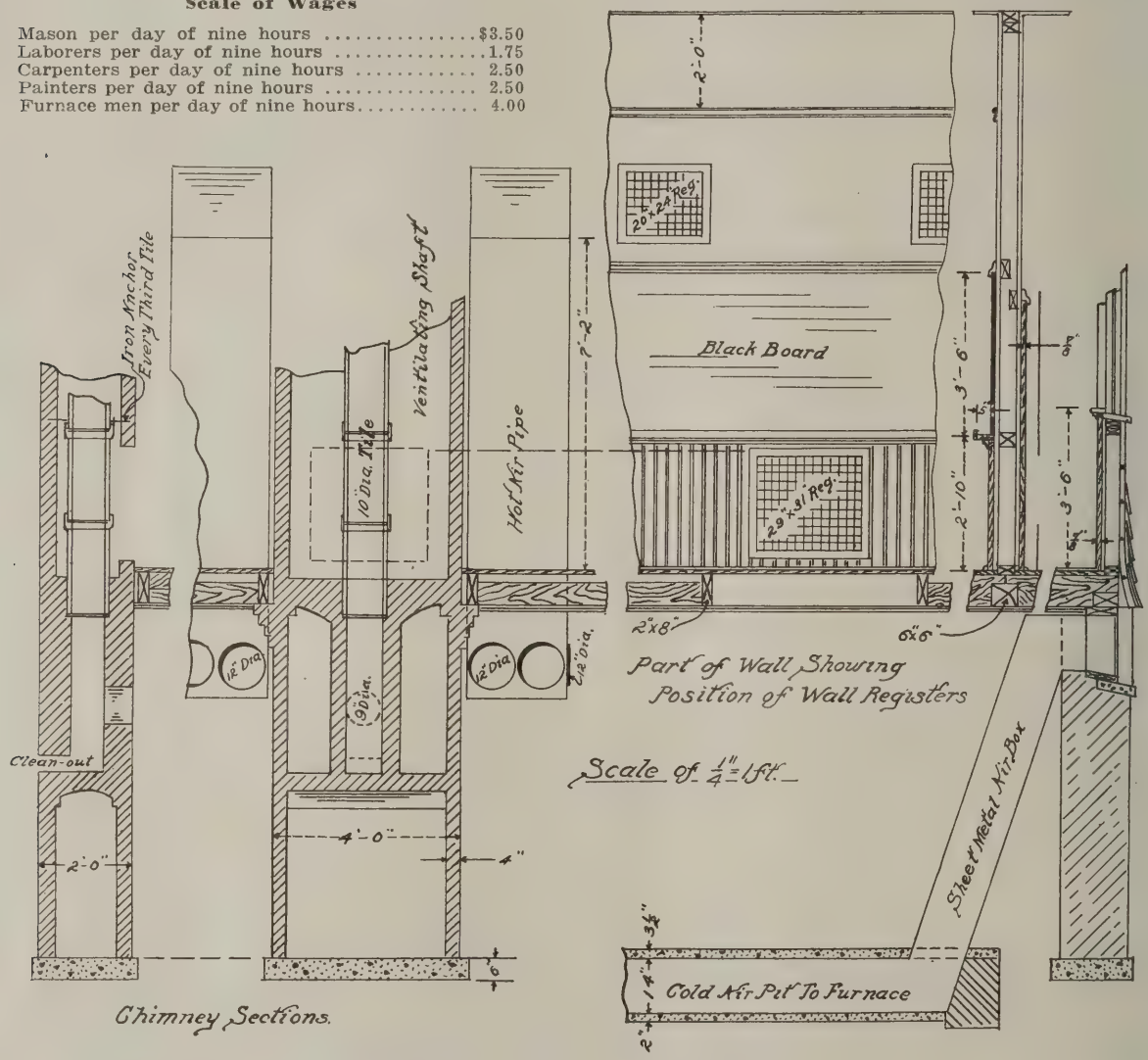
Mason per day of nine hours	$3.50
Laborers per day of nine hours	1.75
Carpenters per day of nine hours	2.50
Painters per day of nine hours	2.50
Furnace men per day of nine hours	4.00

To the prices paid for carpenter's materials must be added 12½ cents per 100 lb. for carting from the lumber yard to the site of the building. All this material had to be carted by team a distance of five miles. There is a grade of about 1400 ft. rise in the five miles, so it will be seen why so large a price had to be paid for cartage.

The cost of the building was considerably below the $3,500 that the building committee were authorized to use. However, they were at the same time requested not to spend any more than was necessary to secure a well-built and comfortable schoolhouse.

The drinking water is obtained from a well drilled on the school grounds, but in order that the pupils would not be obliged to go outside in bad weather for the water, a stone jar was installed on a shelf built into the northeast corner of the classroom. Below this shelf are rows of hooks, each hook being labeled with the pupil's name, and supporting an individual drinking cup.

In order to regulate the light to the best advantage, window shades were provided which could be drawn down from the top and also up from the bottom, so that either half of the window could be shaded as circumstances might require.



MISCELLANEOUS CONSTRUCTIVE DETAILS OF RURAL SCHOOLHOUSE

Cost of Mason's Materials

Stone, $1.50 per cu. yd., delivered.
Sand, $1.50 per cu. yd., delivered.
Portland cement, $11.50 per ton, delivered.
Wood-fiber plaster, $14.50 per ton, delivered.

Cost of Carpenter's Materials

No. 1 rough hemlock, $25 per M.
No. 2 white pine matched boards, ⅞ in., $40 per M.
No. 1 yellow pine matched boards, ⅞ in., $55 per M.
No. 1 comb-grain yellow pine ⅞-in. flooring, $60 per M.
No. 1 wainscoting yellow pine, ⅞ in., $60 per M.
XXX, 18-in. cedar shingles, $4.75 per M.
Metal shingles, $6.00 per sq.

*It should be stated that the building was erected just prior to the breaking out of the European War, and the prices quoted would hardly apply at the present time.

FIREPROOF PHOTO THEATER DESIGN*

SOME VERY IMPORTANT FEATURES TO BE CONSIDERED IN BUILDING MOVING PICTURE THEATERS

THE exterior walls should preferably be of masonry, or of structural steel and masonry, although concrete work with stucco ornamentation also provides a satisfactory fireproof construction. Concrete may be advantageously used for the floor, as it gives a clean, smooth, fireproof surface, which can be easily swept and kept in a sanitary condition. Auditorium floors when made in this way are sometimes washed daily by means of hose streams, the waste water being allowed to drain off near the stage. The floor in the auditorium should be made flush with adjacent floors at all entrances and exits.

INTERIOR WALLS AND PARTITIONS

Interior walls and partitions should be made of fireproof material throughout, and whenever doors or window sashes are required they should also be made of incombustible material. If windows are used in partitions they should be made of wired glass not less than ¼ in. thick. Mirrors are often placed along the walls of lobbies and corridors. These are likely to prove dangerous, however, and should be omitted or removed. Mirrors that may give the appearance of exits are especially objectionable, and there should be no false doors or windows, nor other architectural devices in lobbies, passageways, or elsewhere, that might lead persons to believe there are exits where none exist.

Guard rails should be installed along the edge of the balcony directly over the auditorium. The tops of these rails should not be less than 3½ ft. above the floor level at the front of the balcony. An excellent railing may be made of 2-in. metal pipe, substantially supported at intervals not exceeding 10 ft.

In modern theater construction, cantilever trusses or plate girders for supporting the balcony have largely supplanted the view-obstructing columns in the auditorium that were a feature of earlier designs. In ordinary practice the balcony should be designed and constructed to withstand a safe load of at least 200 lb. per square foot.

VENTILATING SYSTEM

An adequate system of ventilation is essential, and this feature should receive careful attention. The air should be distributed uniformly throughout the house without causing drafts. Effective results are often obtained by locating the air inlets near the ceiling and the outlets near the floor, although there is some difference of opinion in regard to the practicability of this system.

The change of air in theaters of this kind is usually effected by the use of fans which force fresh air into the building through conduits. The amount of air required for each person varies according to circumstances. It is estimated, however, that in order to keep the air in a satisfactory state of purity there should be at least 40 cu. ft. of fresh air admitted per minute for every person present. Adopting this figure as a basis, we have the following:

Rule.—To find the greatest permissible time for completely changing the air of the audience room, divide the volume of the room (as expressed in cubic feet) by the number of seats, and divide the resulting quotient by 40. This gives the maximum number of minutes that should be allowed for replacing the entire air of the audience room by fresh air from the outside.

Example.—Suppose the room to be 100 ft. long, 40 ft. wide, and 15 ft. high, and assume the seating capacity to be 500. Then the volume of the room is $100 \times 40 \times 15 = 60{,}000$ cu. ft., and the rule is applied as follows: $60{,}000 \div 500 = 120$, and $120 \div 40 = 3$. In this case, therefore, the air should be changed at least as often as every three minutes to insure its purity.

ELECTRIC FANS

Electric circulating fans, when fixed by brackets to the walls along the side aisles, should be placed not less than 7½ ft. above the level of the floor, and should be protected by wire guards. Fans arranged to swing in a semicircle are now quite commonly used.

Electrical devices have recently come into favor for improving the air in theaters and other public places. These are sometimes effective in getting rid of disagreeable odors and thus making the air seem purer, but it is doubtful if they are of further value. Moreover, it is far better to circulate fresh air drawn from the outside rather than to attempt to make over that which has become vitiated.

The floor inside of the main entrance should be on a level with the street sidewalk whenever possible. This is sometimes impracticable, but every effort should be made to limit the difference in elevation to 6 ft.

When the number of persons accommodated in the balcony exceeds 200, at least two separate and distinct entrances should be provided for such balcony, and each of these should be not less than 5 ft. wide. Entrance doors are sometimes constructed on a basis of 20 in. in width in the clear, for each one hundred seats in the auditorium, with a proportionate addition for any fractional part of one hundred seats remaining.

The number of exits depends upon the seating capacity of the theater. In every case, however, there

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should be at least two exits leading from the main floor into open streets or avenues, through each of the side walls. Each exit should be at least 60 in. wide. The doors should swing outwardly, and should be fastened so that they may be quickly and readily opened from the inside at any time without any special knowledge of their mode of operation. The use of drawbolts cannot be recommended. We strongly recommend a self-opening arrangement, operated by merely pushing against a conveniently located bar or plate. All exit doors should be so constructed that when open they will not obstruct any portion of any doorway, opening, or passageway.

All fire escapes should be substantially constructed and provided with strong, firmly-secured handrails. When emergency exits and stairways are located inside the walls of the theater they should be separated from the auditorium by a fireproof partition not less than 4 in. thick.

(*To be continued*)

MAKING PROFITS FOR THE BUILDING CONTRACTOR

It is a well known fact that the speed with which cement, sand, gravel, crushed stone and other materials are delivered to building operations is of vital importance to erecting contractors. In figuring building contracts, time is always considered an important factor. The high price of unskilled as well as skilled labor makes idle moments expensive. Many building contracts are also figured on a time basis and the speed and increased efficiency with which materials may be handled at present have saved large sums of money for the contractors.

Every building material dealer in a large city realizes the value of time in connection with the delivery of materials and has found it essential to install a fleet of motor trucks, says *Rock Products*. In most instances, the retailers have found it to their own advantage to purchase this modern delivery equipment; in other cases the investment has been made for the benefit of the trade catered to by the retailer. The motor truck can be identified as an invaluable part of the building material business. Very few dealers operating in anything but small towns have not purchased one or more of these trucks.

Very often on big jobs, special devices for loading and unloading have been constructed to facilitate the operation of the trucks and a striking example of this is the use of a fleet of nine White power-dumping trucks owned by the Cleveland Builders' Supply Co. on the construction of the new $500,000 building for the Richman Bros. Co., Cleveland, Ohio.

The structural work of this building is largely concrete and many tons of sand, cement and gravel are mixed daily. In order to do this work as speedily as possible, the contractors have built a platform of heavy wooden beams on a level with the second story of the structure. Leading up to this platform there are two inclines built of heavy planks with a grade of about 10 per cent. The White trucks with their five-ton load are driven up the incline on one side of the platform. The loads are dumped through an aperture in the platform and the trucks driven across the platform and down the incline on the other side.

In this way trucks are kept running continuously and no time is lost in backing and maneuvering around to find the most advantageous place for dumping. Contractors have highly praised the platform device and say that it saved a great deal of time and money.

FEATURES OF MEXICAN HOUSES

The Mexican country house, or hacienda, is often a picturesque and interesting habitation, and is not only a dwelling place and home, but at the same time a center of industry. Surrounding it are the great plantations, the warehouses, machinery sheds and the numerous huts of the peons, or agricultural laborers. The house itself is often of quaint aspect, and of some architectural pretensions. Moorish looking arches and cornices, and turrets and columns, balconies and verandas, generally of solid masonry, are set there to defy all time.

The houses in the city are generally of two stories, and access to the upper is gained by a broad staircase which terminates on a wide balcony, or rather gallery, above the portico. From this gallery the floors of the upper rooms open. A balustrade runs round the outer side of the gallery, and this is generally covered with flowering plants, ferns, or palms in pots or tubs. Above, the patio is open to the sky, except that the overhanging roof of the house covers the garden gallery, from which it is supported by pillars. The whole arrangement is pleasing and adapted to the climate. The fronting of the house is built immediately upon the street, and the rooms generally open one into the other.

The house of the Mexican peon, a single-roomed, adobe-built habitation, or the wattle-built jacal in which he dwells, belongs to the estate owner, and if the dweller, through laziness or other similar cause, fails to put in an appearance in the fields he is soon forced to vacate.

The interior menage of a Mexican hut is naturally primitive. The fireplace is often outside and consists of unshaped stones, between which charcoal or firewood is ignited. If inside, there is often no chimney and the room is smoky and dark with only a hole in the roof for ventilation. If he has no bedstead, the earthen floor serves the purpose and here he and his family sleep, rolled together in their ponchos, or blankets, for warmth, with utter disregard for ventilation, damp or kindred matters.

San Antonio, Tex., has under way what it terms the most modern type of apartment house ever constructed in that city. It will be two stories high and contain accommodations for twelve families. It is patterned after the popular California apartments, a feature of which is found in the disappearing beds, tables, chairs and other unattractive portions of the furnishings.

MOVING A TWO-STORY BRICK HOUSE

AN OPERATION INVOLVING DETAILS LIKELY TO PROVE INTERESTING TO THE BUILDER

IN many parts of the country and more especially in the rural sections, the local builder is often called upon to consider as an essential part of his business experience, the moving of buildings of all kinds from one site to another, but in the larger cities and their vicinity the raising and moving of buildings is a separate and distinct trade in which those engaged in it make a specialty of the work. We have in the past presented several articles dealing with unusual operations of this character ranging all the way from that of a dwelling house to structures weighing thousands of tons.

At the present time we have the opportunity of bringing to the attention of our readers an operation which occurred in Detroit, Mich., and consisted in the moving of a brick dwelling with 12-in. walls and weighing approximately 200 tons. The building was not only moved several hundred feet, but in the course of its journey it was necessary to turn it entirely around in order to fit the new site upon which it was to be placed.

In the first of the half-tone illustrations presented herewith we show the appearance of the house as viewed from the front after it had been raised upon the cribbing and partially moved from its original foundations. The second picture shows a view of the rear of the house during the process of turning it around. The work was done by Edward G. Kaiser, 518 Field Avenue, Detroit, Mich., who furnishes the following interesting description o fthe way the work was done.



FRONT VIEW OF TWO-STORY BRICK HOUSE AS IT APPEARED AFTER IT HAD BEEN MOVED FROM ITS FOUNDATION

In preparing the building for moving the basement walls were pierced at intervals of 2 ft. throughout the whole length and timbers pushed through opposite holes across the width of the

building. Under these were placed lengthwise of the structure two 16 x 16 in. timbers. Under these again were placed about 100 jackscrews resting on blockings and which were used to raise the building 2 ft. from its foundations. When this stage of the work had been reached, rollers were paced under the lengthwise timbers on runways which rested on blockings.

Two thousand feet of cable, six double sheaves, one capstan, and one team of horses were used in the operation of moving. The building was moved one city block, during which it was raised 2 ft. in order to cross a cement drive and turn halfway about in order to face a cross street.

The house itself was 30 x 50 ft. in plan, two stories in height and had solid 12-in. brick walls. The work was completed without check or injury of any kind to the building. It is interesting to state in this connection that Mr. Kaiser makes house-moving and raising a specialty, he having executed many interesting jobs of work of this nature. It is to him we are indebted for the loan of the pictures from which our halftone engravings were made.



REAR VIEW OF BRICK HOUSE AS IT APPEARED DURING THE PROCESS OF TURNING

SENSIBLE TRADE SCHOOL BUILDINGS

Shortly a new type of school building must appear in every industrial center especially adapted to the various occupuations and equipped therefor. The expense is much less than for high schools. They should be placed near high schools or other common schools so that children in the regular schools who are about to enter employment can easily prepare themselves by going for part of the time to the industrial school. This training will largely supersede that meaningless, ineffective stuff which we have called manual training, says H. G. Miles in *American Industries.*

Into a school located close by elementary and high schools where manual training is taught, the working children of the city can come for one or two half days each week to be taught the occupation they elect, and manual training pupils can get the manual instruction they ought to have, which is very different from what most of them now get. Instruction can be specialized to any extent that the situation warrants and for any number of pupils, particularly when the central vocational school's equipment is supplemented by class instruction in shops.

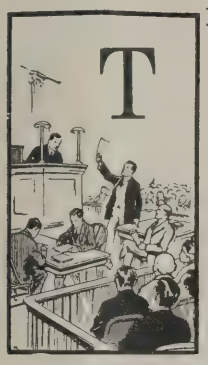
These schools are complementary to the present academic schools. They can carry instruction to the highest point circumstances warrant and for all ages, the older workers coming mostly for evening instruction. By them and not otherwise will our great democracy become educated, efficient, broadly intelligent and happily co-operative. This is not a theory—it is a statement of facts, of things now accomplished in Europe generally, and in several places in the United States.

THE INSTALLATION, CARE AND OPERATION OF THE WARM-AIR FURNACE is the title of an official publication from the Iowa State College, Ames, Iowa, known as Technical Service Bulletin No. 21 and prepared by the Engineering Extension Department. It gives useful information in reference to the effect of the chimney on the operation of the furnace, the proper method of choosing a furnace, of operating it, of moistening the air and supplying hot water for domestic purposes by means of a water heater inserted within it.

SCOPE OF AN ARCHITECT'S AUTHORITY

IMPORTANT LEGAL LIMITATIONS AFFECTING BOTH CONTRACTOR AND SUPERINTENDENT ARE PRESCRIBED

BY A. L. H. STREET



THE scope of an architect's agency for an owner of a building in course of construction or improvement has often been misconceived, as appears from numerous cases in which appellate courts have been called upon to determine whether supervising architects exceeded their authority in particular instances. It has been erroneously assumed that an architect possesses general authority in matters pertaining to the building entrusted to his superintendence. The true rule is that he is limited by the terms of the contract between the owner and the builder, except as his powers may be specially enlarged.

DIRECTIONS FOR EXTRA WORK

In many instances controversies have arisen as to the right of a contracting builder to rely upon directions given by the architect concerning extra work. For instance, in a Maryland case a cemetery company was held not to have been liable to the builder of a gateway for extra compensation for two windows added at the supervising architect's direction, where there was no compliance with a clause of the construction contract providing that "should any alteration be contemplated from the design it may be done, provided the parties beforehand agree upon the price and endorse it upon the contract." The Maryland Court of Appeals said:

"Owners are very much in the power of builders and architects. Changes, apparently unimportant, are often made, the first knowledge of which comes to the owner in the shape of an additional charge for extra work. It may have been to prevent this, and the controversy that often arises from verbal agreements supplementary to written agreements, that the parties had this cautious provision inserted. It was a clause for the benefit of both, especially for that of the owner. If the contractor, relying on the assurance of the architect, chose to perform this work without placing it within the protection afforded to the parties by the contract, he must bear the consequences. * * * The architect was appointed merely to superintend the work according to the plan, with such alterations as the parties might have agreed upon. As such superintendent he had no power to bind the company by promises in their name, whatever he may have thought of the extent of his authority."

Following this decision in a later case, the same court denied the right of a sub-contractor to recover $1,200 for plastering beams in an office building, as an "extra" authorized by the supervising architect, without the sanction of the owners. It appears that the building contract in this case was in the Uniform Contract recommended by the American Institute of Architects and the National Association of Builders.

The Illinois Supreme Court refused to hold an owner responsible for work done by an outsider employed by the supervising architect to replace defective work performed by an original contractor, the employment not having been sanctioned by the owner. The court declared that an architect's authority to supervise and direct work to be done by a contractor and those acting under him implies no power to engage an outsider to do work called for by the contract. In this case it was sought to hold the owner because he saw the work being done by the outsider, but the court decided that the owner was justified in assuming that the work was being done under a sub-contract.

A builder was not justified in departing from specifications for the laying of a cement floor on oral permission of the architect, where the building contract required changes to be evidenced by written consent and order of the architect, according to a holding of the Iowa Supreme Court. That tribunal said:

"The architect's authority is limited. He may not direct the work to be done otherwise than is provided by the plans and specifications, except as he has been given authority so to do therein or by the contract. Unless so authorized he is powerless to relieve the contractor from complying with his undertaking in order to make it easier for him or for any other purpose, if this be detrimental to the owner. In adopting a different method than that prescribed the contractor did so at his own risk. It is not pretended that the architect's assent or direction to change was reduced to writing, and, in the absence of written instructions, the owner is not bound at all by what the architect may have done in these matters. That it may have been difficult to comply with the contract did not waive this rule, nor does this furnish any excuse for non-performance."

The Iowa court approves a statement by the Missouri Court of Appeals to the effect that provision in a building contract that the builder is to build according to directions of the architect should be construed to mean such directions as he may give looking to the completion of the work according to the plans and specifications, and not to mean orders at variance with the plans and specifications.

WHEN A CONTRACTOR CANNOT RECOVER EXTRA COMPENSATION

The same general rule led the California Supreme Court to refuse to permit a contractor to recover extra compensation for extending concrete walls eighteen inches higher than called for by plans and specifications, on mere oral request of the supervising architects.

And in an Arkansas suit the Supreme Court decided that a trial judge committed error in holding that delay in completing a building exonerated the contractor from liability for an agreed per diem penalty for delay if it was occasioned by the act of the

architect in directing extra work. The higher court declared that even if the architect exercised honest judgment in directing doing of work which was unnecessary under the contract that would not prevent the contractor from being liable for a delay.

In a Connecticut case, a builder, under directions of the owner's supervising architect, did certain work variant from and in addition to that called for by the specifications, thereby increasing the cost of the house constructed. The Supreme Court of Errors adjudged that the architect exceeded his authority, and that hence the owner was not liable for any extra charges of the builder, even though the owner did not object at first when a statement of the extras was submitted to him, since the work and materials had already gone into the building and could not be withdrawn.

ARCHITECT AS OWNER'S AGENT

A decision of the Georgia Supreme Court shows that the limitation upon the authority of architects here discussed applies to purchase of materials, but that acts of an owner indicating ratification of an architect's previously unauthorized acts are the equivalent of precedent authorization. The court held that whether an architect who furnishes designs and undertakes to superintend the construction of a building is to be regarded as the owner's agent for the purpose of binding him personally for materials furnished to the contractor depends upon the contract between the owner and the architect. But whether originally so authorized or not, if the architect assumes to act as such agent, and buys materials upon the credit of the owner with the owner's subsequent assent tacitly given, the owner is liable.

Of course it follows, as declared by the Colorado Supreme Court, that if a construction contract indicates that final acceptance of the work is to be made by the owner, a supervising engineer cannot commit the owner in any way by his approval of the work.

AN INTERESTING EXAMPLE

Nor can the architect, unless specially authorized, waive conditions of the building contract upon which the contractor's right to payment of his compensation depends, although the architect's approval is made a condition precedent to payments to be made under the contract. A Massachusetts building contract provided, in effect, that the contractor would, under the direction and to the satisfaction of the architect, provide all materials and do all work called for by certain plans and specifications. Under this agreement it was said by the Massachusetts Supreme Judicial Court that the mentioned clause did not go farther than to make the architect the agent of the owner in the matter of deciding whether the work done fulfilled the requirements of the specifications and drawings, and did not give him authority to waive, in behalf of the owner, the terms on which the owner had stipulated that the payments were to be made.

AN INTERESTING JOB OF STUCCO "OVERCOATING"

One of the effective methods of making old houses look attractive and up-to-date is by giving them an "overcoating" of stucco applied to metal lath. In some instances this is done without removing the weather-boarding, but in the majority of cases, perhaps, the siding is removed and the stucco applied to the metal lath stapled to the sheathing boards. In the case of brick houses or those of brick veneer, the stucco is applied direct.

An interesting case of this nature occurred in connection with an old brick dwelling having a frame addition, the work being done in accordance with European methods by a firm of plastering contractors. The house in question, according to a recent issue of the *Medusa Review,* was located in Greenville, Ohio, and the first or scratch coat consisted of one part Medusa gray Portland cement, 12½ per cent hydrated lime and two parts bank sand. This was applied with dippers after thoroughly wetting the brick and was allowed to set but not become hard after which the second or brown coat was put on and floated. This second coat was of the same mixture as the scratch coat, was applied with dippers and allowed a short time to set, after which it was floated to an even surface. After the second coat was thoroughly dry, the building was given two dash coats and two parts Medusa waterproofed gray Portland cement, two parts washed sand and 12½ per cent hydrated lime. The result was a tint of light bluish-gray.

The building was stuccoed according to European methods by the Oriental Stucco Company at Greenville, Ohio, and C. J. Lang, manager, furnished the following interesting information: "I have been in the business for eleven years and always insist on the brown coat being thoroughly dry before applyig the dash or finish coat. We never had a job crack nor peel nor have any streaks shown as you will find in many cases when the dash finish is applied before the second coat has become dry."

PHYSICAL PROPERTIES OF CONCRETE

The Engineering Division of the Bureau of Economic Geology and Technology is conducting an investigation to determine the variation in the physical properties, compressive strength, coefficient of elasticity, tensile strength, pervousness, bond and resistance to abrasion of dense concrete due to a variation in the relative quantity of cement used in the preparation of the concrete.

The investigation, which is being conducted by Professors F. E. Giesecke and S. P. Finch, assisted by E. F. Ries, was prompted by the belief that it is better and more economical to prepare concrete by mixing the fine and coarse aggregates in proportions which produce a dense concrete, and to incorporate as much cement as is necessary to produce the strength or other physical properties desired for the work in hand, than to mix the ingredients according to some arbitrary proportion, like 1-2-4, 1-3-5, etc., as is generally customary at the present time.

PRACTICAL HOISTS FOR THE BUILDER

SOME INGENIOUS APPARATUS USED BY THE BUILDER IN DOING DIFFICULT WORK

BY JAMES F. HOBART

OCCASIONALLY the practical builder has urgent need for adequate hoisting apparatus not only for raising timber and other materials to the upper parts of a building, but sometimes for putting machines into buildings, erecting stacks, hanging shafting and a thousand and one things which a builder must take care of in his business. The illustrations and descriptive matter which follow will afford the reader an indication of how the writer has on several occasions rigged up adequate hoists at little expense. Fig. 1 shows the ingenious hoist that was used by a concern in Indianapolis for placing a new wood-steaming retort into the second story of its factory.

The amount of tackle available was a 1½-ton differential chain hoist and a small rope tackle. The hoisting apparatus was rigged up by cutting a hole through the siding of the shop just above the second floor, to which two hard maple planks, 2 x 10 in., were pushed out about 4 ft., as shown at *A-B*. These planks were well blocked at both ends, and the inner ends were securely fastened to the floor by plank, blocked and bolted. The planks were separated by one inch strips at each end, and a bolt through the planks held them in position. A trolley was then made by drilling two holes in a piece of steel 4 in. wide, 24 in. long and ¾ in. thick. A 1-in. pin was driven tightly into the upper hole and a couple of 6-in. cast-iron pulleys with 1½-in. face were slipped upon the pin, and a hole drilled through the latter at either end just outside the pulleys was fitted with a spring cotter pin, which prevented the wheels from coming off the improvised "trolley."

This trolley, shown at *C*, Fig. 1, was thrust down between the maple planks *A-B* and the differential chain tackle hung from the lower end, as shown at *D*. The tackle was not long enough to permit the load *K* being raised at a single operation, therefore a double pull was arranged, the casting *K* being raised a few feet, a couple of carpenter's trestles slipped beneath it and the hoisting chain shortened until the casting could be swung upon the landing stage *E* before the tackle pulleys came together at *D*.

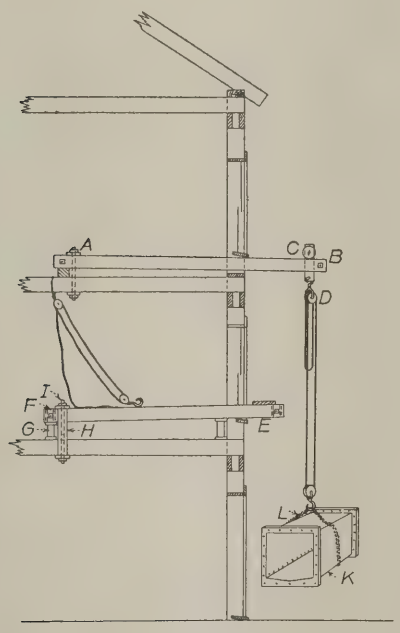


Fig. 1—One Form of Practical Hoist

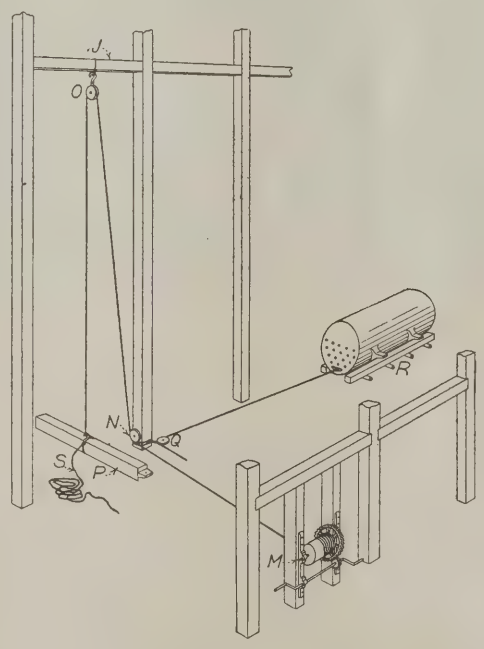


Fig. 2—A Hoist Used When Erecting Factory Buildings

The landing stage was made of a couple of 3 x 10-in. hardwood planks placed on edge and bolted fast to each other at either end after being separated about 18 in. by distance pieces on either side of each bolt, as indicated by the dotted lines at *E* and *F*. A blocking was then placed on the floor just inside the window and the landing stage placed upon it. The other end of the stage at *E* was supported in a similar manner. A hold-down affair

was arranged, as shown at *H*. The device was made just high enough to permit the landing stage *E-F* to slide under the top yoke so that the stage could be pulled back or thrust forward out of the building at will. A piece of board placed on top of the stage at *E* served as a platform for the workmen while operating the hoist *D*.

The heavy pieces were hoisted and landed upon the stage *E-F*, then the chain tackle was taken down and placed beside the rope tackle, being made fast at a point to one side of the stage so that when one of the parts of the casting was raised by the chain tackle in its new position the load swung sideways free of the landing stage and was then lowered to the floor.

Another very convenient hoist is shown in Fig. 2, which represents an apparatus used by the writer when erecting mills and factories. The essential parts consists of a "crab" or winding drum made



FIG. 3—AN ELECTRIC HOIST

up of a double-geared shaft made into a winding drum. The hoist was bolted directly to a couple of timbers, one of which belonged to a blocking and the other timber set up temporarily to accommodate the hoist shown at *M*. The post *N* is utilized for the attachment of a snatched block, by means of which the hoisting cable is led to the block *O*. A light line *S* is attached to the hook on the end of the cable. This line serves a double purpose. With it material being hoisted can be guided to a considerable extent and the light line also serves to pull the hoisting cable back again for another load.

For moving a boiler the hoist was arranged as shown at *Q-R* in Fig. 2. The cable was removed from the sheave *O*, which, by the way, was left in its position and used there as required, being a sort of semi-permanent fixture. The snatch block at *N* was swung around to the new position at *Q* and the cable led directly to the boiler, which was loaded upon timbers and rolls.

In every instance as soon as power was obtainable I have connected the winding drum by means of a belt and pulley set up to accommodate the hoist and a circular saw, which, by the way, should always be a part of the contractor's tools on the job. When possible it will pay to install at the outset an electric motor to drive the hoist instead of the "two-man-power" usually available. Do not wait for the building to be half way erected before installing the motor.

During recent changes in a large woodworking plant it became necessary to quickly and cheaply rig up some sort of a hoist so that the timber and covering for a large roof could be raised from the ground and materials for a smokestack could likewise be delivered to the top of the building. To accomplish this an electric hoist was rigged as shown in the picture, Fig. 3. The hoist was very simple, being made for the most part of waste pieces of wood. Its first cost was low, owing to the fact that these pieces were picked up in the yard of the factory and nearly everything needed in the construction of the device was found in the storage room for old machinery.

The winding drum was housed on several pieces of 2 x 6-in. plank, and a small pulley was placed on the main shaft to receive the vertical belt shown in the engraving. By lowering on the hand lever the winding drum would be raised, the vertical belt tightened and up would go the bucket full of mixed concrete. When the bucket arrived at the top of the chimney, the lifting of the end of the lever caused the belt to slip and the hoisting movement stopped. The bucket would remain stationary as long as the lever was held fast, and when the bucket was to be lowered it was only necessary to lessen the pressure on the lever and allow the pulley to slip on the brake block, thus lowering the bucket as fast or as slowly as desired.

A few strips of board prevented the belts from slipping off the pulleys during the hoisting action. The simple construction of the hoist made its possible failure upon the side of safety. Should the belt break the brake would prevent the falling of the bucket. Should the motor give out the brake was still in evidence and practically insured everything about the hoist except the breaking of the cable, which was closely inspected several times a day and changed for a new one upon the slightest evidence of weakness or wear.

SHINGLES TREATED WITH FIRE-RESISTING PAINT

A small roof section covered with shingles painted with a zinc borate paint has just been tested as to its fire-resistant properties, after having been exposed to the weather for nearly three years on the roof of the Forest Products Laboratory at Madison, Wis. Other shingles freshly painted with the same paint were tested in comparison. The results show that the paint had resisted the action of the weather without losing its fire-retarding properties to any marked extent. A close examination of the exposed portion of the shingles showed that the paint was in first-class condition. It was concluded, says the report, that a zinc borate paint has good lasting qualities, and that it retains its fire-retardant properties for at least three years.

OXIDIZING COPPER FRONTS OF SHOPS*

METHODS TO HASTEN THE PROCESS OF OXIDATION—THE SOLUTIONS—TIME REQUIRED

AS copper shop fronts and copper-sheathed bay windows and balconies are becoming quite numerous it will no doubt interest many readers to know how the metal may be treated in order to hasten oxidation, thereby producing the effect known as patina—the incrustation given to articles of copper and bronze by long exposure to the elements.

ANTIQUE BRONZE EFFECTS

The genuine patina or antique bronze consists of basic carbonate of copper, which is produced upon copper by the influence of the atmosphere. This natural process, which is rather slow, may be hastened by various methods or treatments, but no matter which particular one may be resorted to, the most important part of the work is that the metal surface to be treated must be cleansed first with a strong solution of soda and subsequent rinsing with clear water.

The oxidizing solution may be acid or alkaline, the former requiring more time to perform their function, the latter acting more rapidly. The first consists of acetic acid or oxalic acid, etc.; the latter of salammoniac, carbonate of ammonia, etc., in solution.

The acid solutions produce at first a bluish-green effect, which only after a long time turns to the color of verdigris, and the patina so produced has no great resistance to water, as it is rather crystalline. The ammoniacal solutions, however, as noted above, are more rapid in their action, and films of bluish-green to greyish-green color and a dull, earthy appearance are produced.

A VERY EFFECTIVE SOLUTION

A very effective and durable patina is had by brushing over the copper uniformly and repeatedly with a solution prepared as follows: 1 part by weight of sal-ammoniac, 3 parts by weight of tartaric acid, 9 parts of common salt dissolved in 15 parts boiling water, to which solution, while still hot, 8 parts by weight of a solution of copper nitrate of 1.100 specific gravity is added.

If used when the air is saturated with moisture the action is more rapid than in dry air. When more common salt is used in the solution than here indicated the patina will have a more greenish tone; if less salt is used the effect will be more of the bluish tone.

If time is not so much of an object, an acetic solution may be made by mixing 1 part by weight of acetic acid of 1:04 specific gravity with 50 parts by weight of water. The copper surface is sponged several times daily with this solution, and in a few days a film of basic acetate of copper will form, which, under the influence of the carbonate acid in the air, will change into adhesive basic carbonate of copper, and consequently the incrustation so formed is of similar composition to genuine patina. The process will require ten to fourteen days in this case, while by the former method it may be effected in from four to five days.

ANOTHER OXIDIZING SOLUTION

Another solution for oxidizing copper, which, however, is best applied during dry, warm weather, is as follows: 5 parts sal-ammoniac, 5 parts tartaric acid, 22 parts common salt, 40 parts copper nitrate and 30 parts vinegar, all by weight, are reduced with 3 parts by weight of water.

A more bluish-green effect may be had with this simple solution: 1 part by weight of sal-ammoniac, 3 parts carbonate of ammonium dissolved in 24 parts of water.

The writer has been informed by an old-time painter that he has had very good success in this work by scouring the surface of copper sheathing with soda solution, rinsing and wiping it dry. Then repeatedly sponging with strong vinegar to which he had added about 5 per cent. of spirits of hartshorn (10 per cent ammonia) and about 2 per cent of a saturated solution of oxalic acid.

There are some confusing opinions in regard to patina, as is evidenced by the fact that methods have been suggested by which this incrustation or oxidation of the metal was to be produced by one or more coats of paint. These are but poor imitations that will not fool the people that know better.

PATINA IS NOT VERDIGRIS

Patina (*serugo nobilis*) is not verdigris. It consists of the carbonates and hydroxides of copper, and is the metallic coating that takes on a different unchangeable color from that of the metal itself, but retains the metallic lustre. At one time the process of oxidation was accelerated by frequent washing of the metal with soap and brushing over with oil afterwards, but this practice has been abandoned long since.

The imitation of patina with wax color or lacquers is somewhat in vogue on fronts and balconies lined with sheet zinc, but this is not at all durable.

Balsa wood, found in Central America, is said to be the lightest known wood. It is lighter than cork and has an average specific gravity of only 0.104.

*Reprinted from the Painters' Magazine.

ATTRACTIVE DWELLING FOR THE SUBURBS

MAIN STORY IS CREAM COLORED STUCCO ON METAL LATH—SECOND STORY IS SHINGLED

THE subject of our colored supplement this month is a house intended for a family of four or five persons. The main story is to be cream-colored stucco applied over metal lath, and the walls above this, as well as the roof, are to be of stained shingles.

FOOTINGS AND FOUNDATIONS

According to the specifications of the architect, the footings are to be of concrete 10 in. thick and 22 in. wide. The foundation walls are also to be of concrete 10 in. thick. The cellar is to extend under the entire house.

The sizes of some of the more important framing members are: Sills, 4 x 6 in., laid flat; corner posts and plates, 4 x 4 in.; studs, 2 x 4 in.; first-floor joists 2 x 10 in.; second-floor joists, 2 x 8 in., all placed 16 in. on centers; and rafters 2 x 6 in., placed 20 in. on centers.

Over the hemlock sheathing, which is to be laid diagonally, is to be placed a two-ply building paper. Over this, on the main-story walls, are to be placed furring strips to receive the metal lath. The stucco is to be applied in three coats, the scratch coat consisting of one part of cement, 2½ parts sand, and not more than ten per cent of lime putty, to be applied to a thickness of ⅜ of an inch. The second or backing coat shall increase the thickness behind the lath to not less than ⅝ of an inch and the finish coat to consist of one part cement, two parts white sand, and three parts pebbles, is to be applied to a thickness of ⅜ in. The stucco is to have a light cream tint.

The second-story walls, as well as the gables, are to be covered with shingles which have been dipped two-thirds their length in shingle stain.

THE CHIMNEY

The chimney is to be of brick, laid up in cement mortar and given a stucco finish to match that of the first story. The flues are to be lined with vitrified flue lining, and there are to be tile caps.

The exterior trim is to be primed with lead and oil and given two coats of paint.

The front porch floor is to consist of 8 x 8-in. tile, and the floor of the sleeping porches and balcony are to be covered with canvas and painted.

All doors are to be of pine, and veneered, being finished to match the trim of the rooms. Door and window frames are to be of white pine. Interior trim may be either cypress or chestnut, according to preference.

The floors in the first story are to be double, flooring felt being laid between the sub and finish floors. In the living room, dining room and hall the floors are to be of oak; in the kitchen, pantry and attic, of North Carolina pine; and in the bedrooms, of comb-grained Georgia pine. The finish floors are to be filled and finished with two coats of wax and then polished.

The plastering in the main rooms is to be three-coat work with a sand finish, and the walls are to be tinted with a waterproofed paint with a flat finish; all other rooms are to be plastered to a hard smooth finish. The walls of the kitchen, pantry and bathroom are to be treated to two coats of a waterproofed paint, and the walls of the bedrooms covered with flat tinted papers and cut-out borders. The attic is to be finished off with wall-board.

THE TRIM

The trim in the living room, dining room and hall is to be filled, stained, and rubbed to a smooth, dull finish. The bedroom trim is to be finished natural, while the kitchen is to be enameled white, three coats.

The bathroom floor is to be of mosaic tile. Above a 10-in. sanitary base is to be placed a 3-ft. wainscot consisting of 3 x 6-in. tiles. There is to be a medicine closet, a one-piece porcelain enameled wash basin, a porcelain enameled bathtub, both to be supplied with hot and cold water, a water closet with china bowl, porcelain seat and low-down tank. All exposed pipes are to have a nickel-plated finish.

The kitchen is to contain a gas range, a gas water heater, and iron enameled sink with high back, and earthenware wash trays with removable covers, all fixtures to be supplied with hot and cold water.

The hardware is to be of a bronze-plate finish, with switches for each room and one at the head of the stairs to control the light in the hall. The front and rear doors are to be connected with electric bells. Combination gas and electric fixtures are to be provided. Heating is to be by means of steam, the apparatus being of a size calculated to heat the house to 70 deg. in zero weather. Radiators are to be of a bronze finish to match the hardware.

LAYOUT OF ROOMS

The main part of the house is entered through a vestibule, on either side of which is a closet communicating with the hall. At the right is a large living room containing a fireplace built up of tapestry brick and with hearth of 6 x 6-in. dark red tile. The living room communicates with the dining room through sliding doors. The dining room contains a bay window with seat, and communicates with kitchen through a convenient pantry. The icebox is so placed as to be readily accessible from the pantry and iced from the porch. Beyond the dining room is the sun porch communicating directly with out of doors.

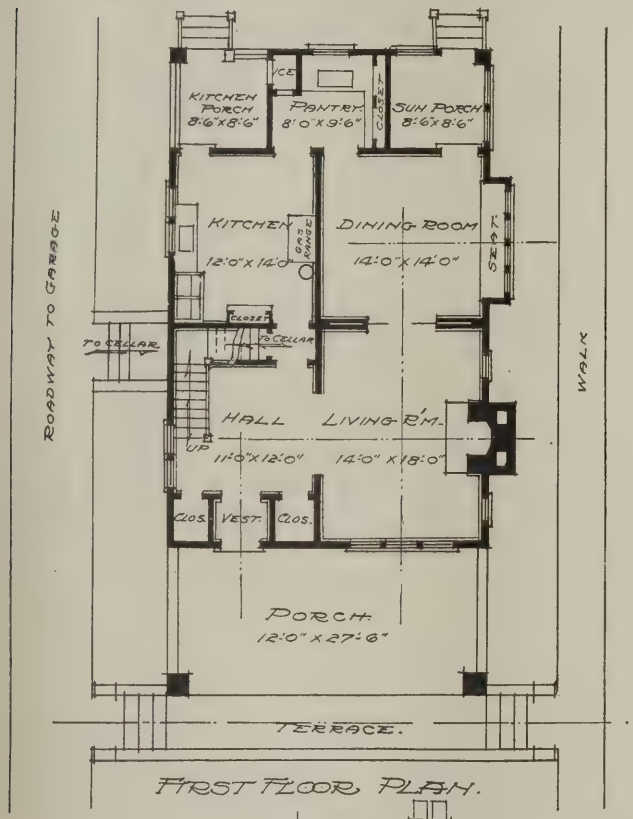


BUILDING AGE
NEW YORK

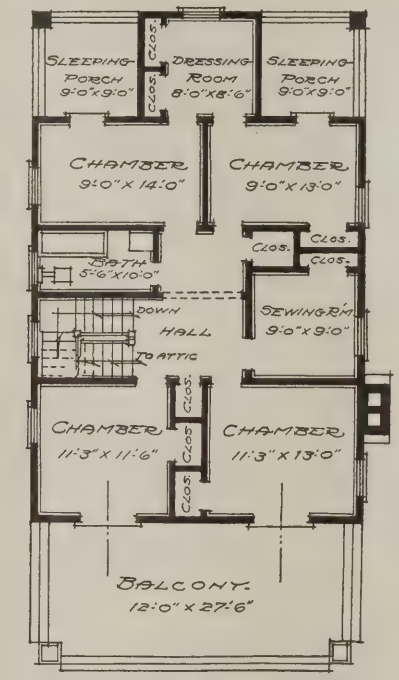


FRONT ELEVATION.

RIGHT ELEVATION.

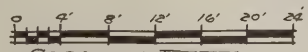


FIRST FLOOR PLAN.



SECOND FLOOR PLAN

ARTHUR WEINDORF, ARCH'T.
LONG ISLAND CITY, N.Y.

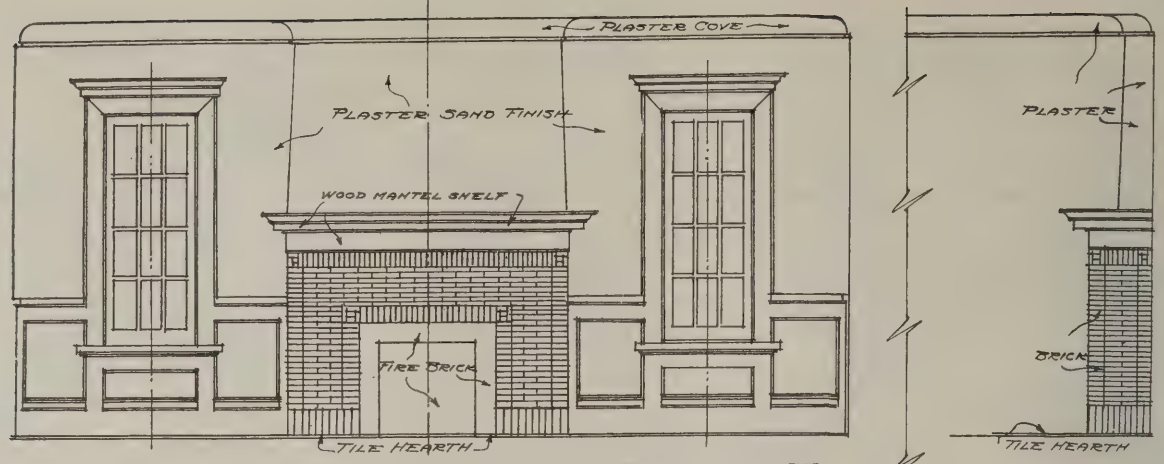


LEFT ELEVATION.

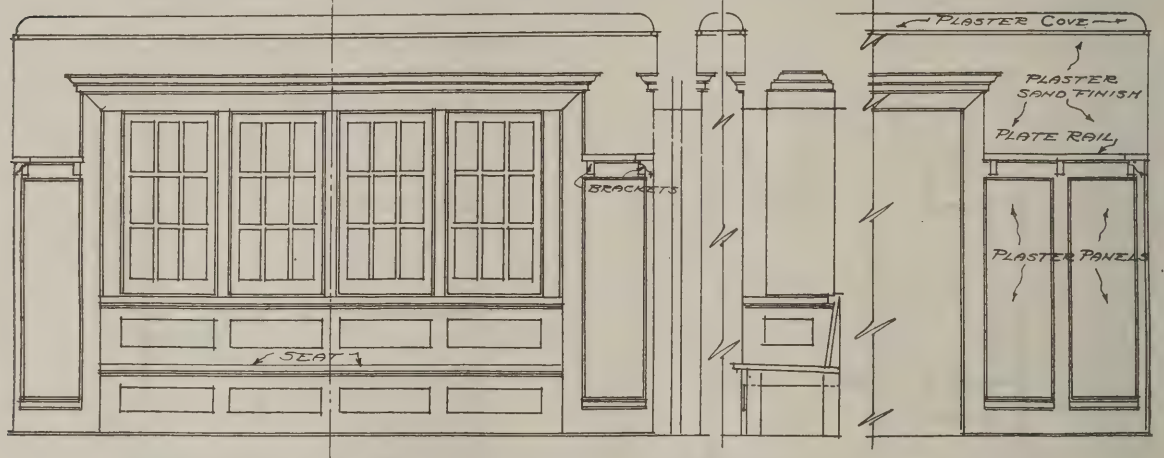


REAR ELEVATION.

PLANS AND ELEVATIONS OF THE HOUSE SHOWN ON THE SUPPLEMENTAL PLATE



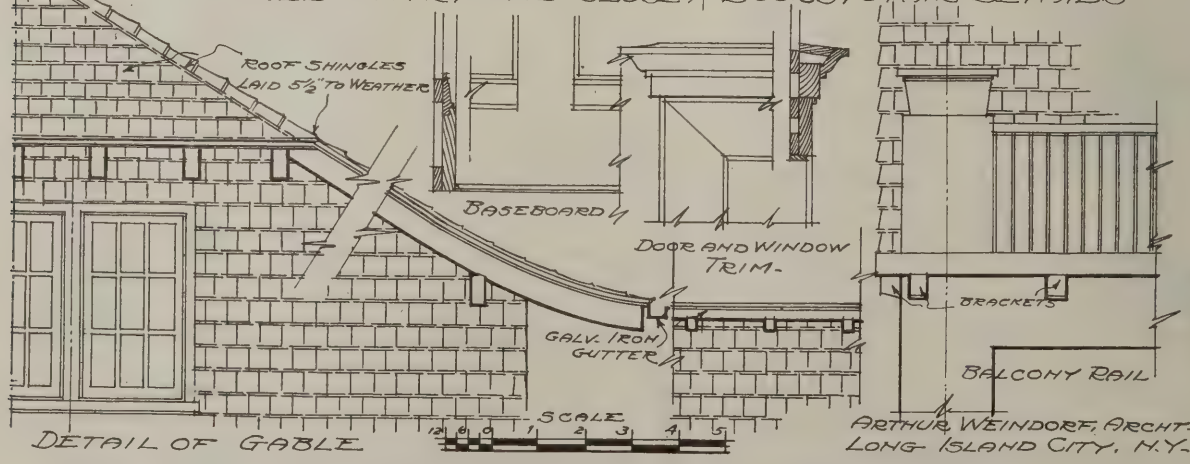
DETAIL OF LIVING ROOM TRIM AND FIREPLACE.



DINING ROOM TRIM. SEAT PLATE RAIL, AND PANELING



HALL ENTRY AND CLOSET DOORS, STAIR DETAILS



DETAIL OF GABLE

ARTHUR WEINDORF, ARCHT.
LONG ISLAND CITY, N.Y.

MISCELLANEOUS DETAILS OF THE HOUSE SHOWN ON THE SUPPLEMENTAL PLATE

The kitchen is reached from the outside by means of a small porch, more or less inclosed, and the front hall may be entered through a short passageway from which descend the stairs to the cellar.

The second story contains two front chambers opening upon a balcony, a sewing room, and two rear chambers opening into a dressing room common to both. Each of these two rear chambers is provided with a sleeping porch.

The bathroom opens from the hall, which is so placed as to provide access between the various rooms with a minimum of waste space.

The architect estimates the cubical content to be 40,096 cu. ft., including the front porch, and he places the unit cost at 17 cents per cubic foot, this figure including the contractor's 10 per cent profit.

The house was designed by Arthur Weindorf, architect, Long Island City, New York, or care THE BUILDING AGE, 243 West Thirty-ninth Street, New York City.

DESIGN OF TRUSS FOR A FLAT ROOF

A FORM OF CONSTRUCTION DESCRIBED BY THE CORRESPONDENT OF AN ENGLISH PUBLICATION

THE construction of roofs is a phase of work that is of never-ending interest to builders everywhere, more especially the framing of the members used in wha tare known as "at roofs," by which is meant a roof having an inclination of not more than ¾ in. to the foot, although about ½ in. to the foot is the usual slope. Roofs of this kind are commonly placed over lodge rooms, assembly halls, concert rooms, etc., and the problem of supporting them is one which frequently confronts the builder. A correspondent of an English publication recently contributed to its columns a description of a truss for a flat roof, some reference to which may be of interest in this connection. The design is that of a Howe truss and is intended for a span of 47 ft. between pier walls as pictured in Fig. 1. The correspondent says:

This Howe truss is proportioned to carry a 6-lb. lead, flat roof with the side slopes battened and tiled as well as a plaster ceiling supported on 2 x 6 in. ceiling joists suspended from the lower chord or tie beam which, without overstressing the truss, can be of an enriched class of decoration suitable for a public hall or concert room. Allowance has been made for a snow load of 5 lb. per square foot and for a wind pressure on the side slopes of 26 lb. per square foot. The extreme length of the lower chord or tie beam is 50 ft. 1 in. The distance between ex-

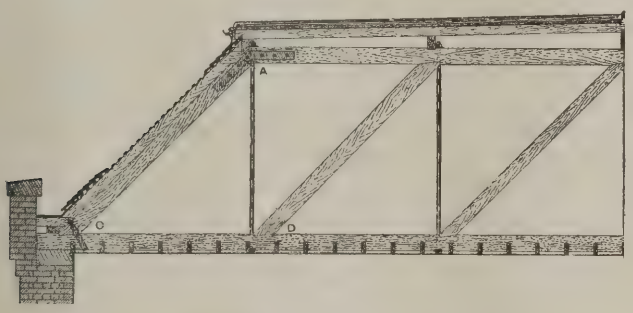


Fig. 1—Partial Elevation of the Truss—Scale ⅛ In. to the Foot

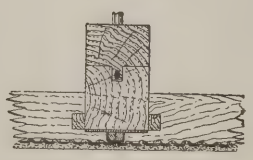


Fig. 6—Section on Line E-E of Fig. 5

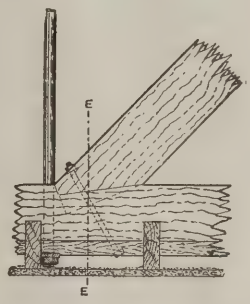


Fig. 5—Detail of Joint at "D" of Fig. 1

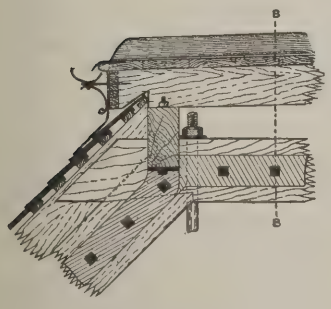


Fig. 2—Detail of Joint "A" of Fig. 1—Scale ½ In. to the Foot

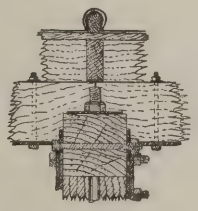


Fig. 3—Section Through Top Chord on Line B-B of Fig. 2

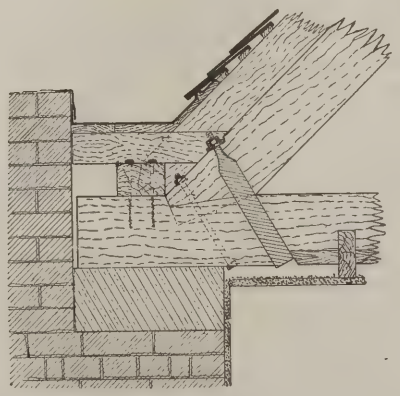


Fig. 4—Detail of Joint at "C" of Fig. 1

ternal points of the principal rafters is 48 ft. 4 in., which is divided into six panels 8 ft. wide and 8 ft. high on the center lines. As a consequence, all braces are inclined approximately 45 deg. and the tie rods are vertical.

The trusses are spaced 10 ft. apart and the camber is ¾ in. for every 10 ft. between the wall and the center rod. This represents roughly 1½ in. rise at the center which can be obtained by springing the lower chord and marking shoulder lines on the braces when froming.

All joints must have a true and perfect bearing, wood to wood, and must be primed with red-lead in linseed oil. The material may be Memel fir or pitch-pine, free from large knots and shakes, all waney and sap timber being rejected.

The stuff is framed up from the saw to 8 x 8 in. for principal rafters, top chord, and second panel braces, with 8 x 6-in. middle braces and 8 x 8½-in. or 9-in. lower chord or tie-beam.

IRON TIE RODS

The iron tie-rods are of best wrought iron (round), the diameters being: Outside rod, 1⅜ in.; second rod, 1¼ in., and center rod, 1 in. The rods are threaded at both ends for hexagon or square nuts, with 2½-in. x ½-in. plates, 7 in. long, to each nut, the lower plates being let into the under side of the tie-beam, as shown at Fig. 5.

The braces at the joints are bolted to the chords with ⅝-in. diameter bolts, fitted with nuts and round washers. The feet of the principal rafters are further secured with double bolt-ended straps, forged out of 2½-in. x ½-in. flat plate-iron, with top plates (of the same dimensions) drilled to receive the ⅝-in. bolt ends.

At the head of the principal rafters an angle plate of ⅜-in. iron 4 in. wide, is drilled for ⅝-in. bolts and nuts, an auxiliary angle plate being placed at right angles, to line with the purlins, and bolted up to the corner plate mentioned above. This plate is bolted to the under side of the purlins with two ½-in. bolts each 10 in. long.

THE PURLINS

The purlins are notched ½ in. on to the top chord. In the half-elevation the outer purlin is shown partly removed, in order that the angle plate on the truss may be seen. Details of the lead flat, the tiled slope and the plaster ceiling are clearly shown in the illustrations.

A gutter is provided to drain the lead flat, with down pipes leading to cesspools at the lowest levels of the bottom gutters. The lead apron is copper-nailed under the lap of the roof sheeting. This board may be rounded on the edge and rabbeted out to the thickness of the lead apron; or, alternatively, a thinner outside board may be used.

A 1¼-in. fascia board is nailed to the end of the rafters to serve as backing when dressing the lead apron, which comes down on the tiles a sufficient distance to cover the joints at the lap. The side rafters, 2½ in. x 5 in., are birdsmouthed on to the pole plate, which is secured to the tie-beam with four coach screws (each 9 in. long), and has a bearing on the brickwork of the main wall.

Snow gratings should be placed in the lead gutter and on the lead flat. All the details presented herewith are to a scale of ½ in. to the foot.

NOVEL METHOD OF VENTILATING SCHOOL ROOMS

Among the most vital points in connection with the present-day schoolroom are the system of ventilation and the method by which it is heated. What is said to be an entirely novel method of accomplishing this, and which seems particularly adapted to one-story school houses of several rooms, has been adopted by Architects Mullard & Pollard, Fort Worth, Tex., in connection with two school buildings in that place.

This system may be termed the unit classroom system, the heating coils, the fan and plenum chamber being individual in each classroom, located in the "attic" of the cloakrooms (which thus have a low ceiling) and being in charge of the teacher. It is claimed for this system that it saves the cost of long ducts and fresh-air flues, that it is positive and absolute, that there are no disturbance by wind or opening of doors; no loss of momentum in the air currents due to friction and loss of heat due to radiation into ducts and flue walls; space also saved in basement by the absence of a large plenum chamber with fans, washers, heater, etc.

Describing this novel arrangement, it may be stated that the cloakrooms are divided horizontally, so that the height of the ceiling for the wardrobe or clothing is 7 ft. The upper part above the wardrobe is fitted up for an individual plant to heat and ventilate that particular classroom. The story height being 13 ft., the portion which may be called the chamber thus has a ceiling 6 ft. high.

Looking at this building from the outside, one notices louvres above the cloakroom window, these louvres fronting the air intakes of the chamber. The fresh air is drawn through these louvres and over a series of steam-heat coils by a large electrically driven fan. From the fan the air is forced into the classroom through a diffusing outlet placed about 7 ft. 6 in. above the floor line. Foul air is taken out by means of a vent shaft, the opening into which is at the floor and in the cloakroom. The door of the cloakroom is raised 18 in. from floor line so that air may pass freely into cloakroom and to the exhaust register at end thereof. The plenum (pressure in the vent chamber) and natural draft in the flue are depended on for removing foul air. The whole, it is claimed, works noiselessly and satisfactorily. The plants have been in operation in the Fort Worth schools for over a year, and the presence of fan and motor is not suspected by visitors. The control is in the hands of the teachers always. It is said to be economical in first cost and operation. These two buildings are said to represent the newest school architecture in Texas.

LAYING SLATE AND COMPOSITION SHINGLES

VARIOUS KINDS OF SLATE — BEST SIZE TO USE—ORNAMENTAL EFFECTS

BY L. S. BONBRAKE

SLATE is quarried principally in Vermont and Pennsylvania, black slate coming from the latter state almost exclusively, while "sea green," "unfading green," purple, variegated and red can all be secured from the Vermont quarries. In assorting slate and testing for laying it will be found that black slate splits lengthwise while green breaks across the slate, hence culls are looked for coming that way, but little trouble will be experienced from that cause, for as a rule No. 1 slate is clean, sound stock, the larger sizes, if not perfect, being cut down at the quarry into good stock of smaller dimensions.

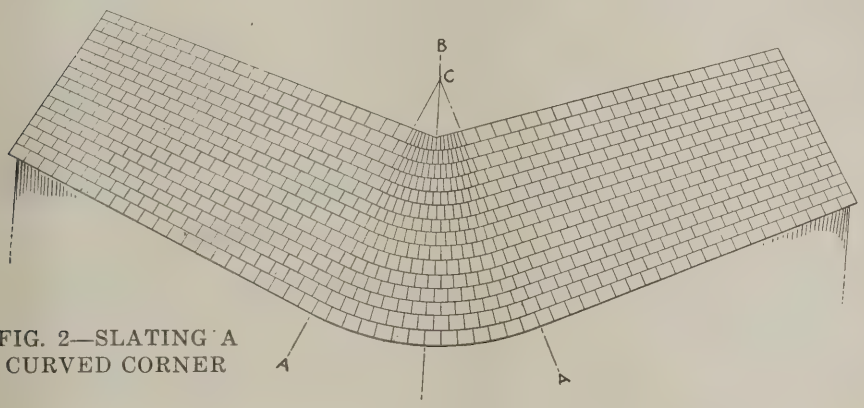


FIG. 2—SLATING A CURVED CORNER

As all sizes are cut in width just one-half their length, it is advisable to decide upon some one size for stock and avoid a hangover of several widths which may be accumulated, yet not be enough of any one kind available for a job that must be done in a hurry.

The size 11 x 22 can be used almost exclusively as it is not too large for a dwelling and can be laid almost as rapidly as 12 x 24 on a barn. It is not the size generally used by slaters and is more apt to be found in stock for a rush order. By using purple as a color for working out a combination design with green the roofer will be able to get it from the same dealer in Vermont and can have both go in one car.

Composition slate and asbestos shingles are made in gray and red colors, while asphalt shingles are green and red and any of the several ornamentation schemes illustrated in this and former articles may be worked out, using gray or green for the body of the roof according to the taste of owner.

The base for shingles may be first and best solid sheathing made with surfaced boards and covered with roofing paper or tar sheeting. When wood sheathing alone is used, it is laid with the rough side up. For barns, sheds or other buildings of similar character, a cheaper base is made by using wood strips. Often a 6-in. fence board is sawed into 3-in. strips which are spaced as shown at one corner of Fig. 1. It will be observed two 6-in. boards are used for the bottom, in addition 1-in. facia and 1-in. slate projection over facia gives 14 in. from bottom of the slate to top of this sheathing. Using 11 x 22-in. slate for this roof, the space from the center of the first 3-in. strip to the top edge of board should be 6½ in. from center to first strip, to second 8 in., from second to third, 9½ in. and remainder 9½ in, from centers from third 3-in. strip to the comb. There should be a 6-in. board finish at the comb for nailing ridge roll or other finish.

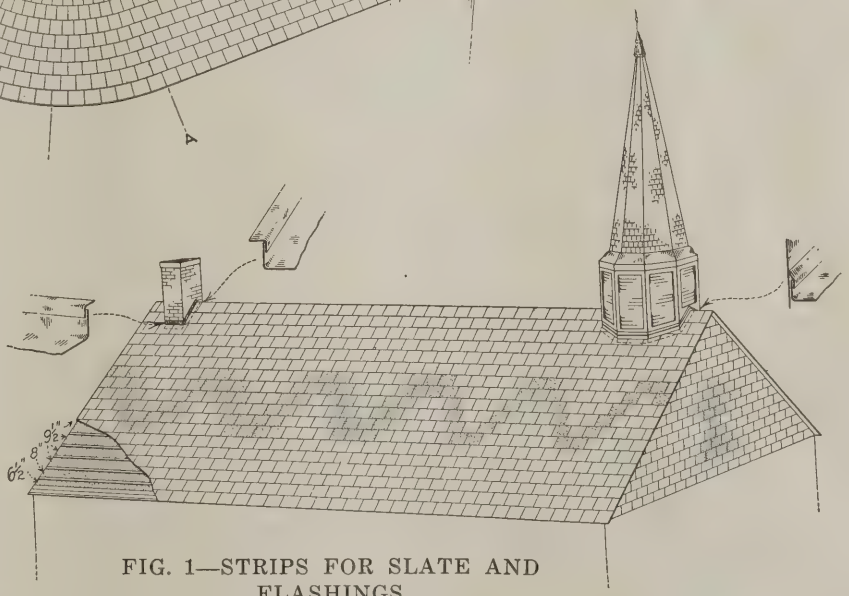


FIG. 1—STRIPS FOR SLATE AND FLASHINGS

Circular work is the most difficult and tedious of any connected with the slate roofing business and is generally used in connection with bay windows or porticoes and usually found in juxtaposition with straight work at each end as shown in center of Fig. 2. In order to produce symmetrical looking work, care must be observed in cutting the slate true to line.

The front of the roof is divided into as many spaces as the number of slates required in width to fill in from lines *A* to *A*, commencing at line *B*, which is center. The back is spaced an equal number or the same as if a line were drawn from the apex *C*. The slate is cut and laid each way until straight lines are reached, when the work is proceeded with in the usual manner. The ends of the first row should be cut to conform to radius of the circle. The remaining courses are let straight at their butts.

When slate roofs are damaged by falling chimneys or other unavoidable accidents as shown by Fig. 3, they can be repaired so as to be as tight and durable as with any other character of material and perfectly free from leakage.

First, the roof is cleared of all cracked or broken pieces, nails of the top row may be cut with the slater's ripper, slate pulled out, thus exposing the nail heads of the next row, going on down the roof as far as necessary. When the roof is clean, as in Fig. 4, commence at the bottom and lay up in the

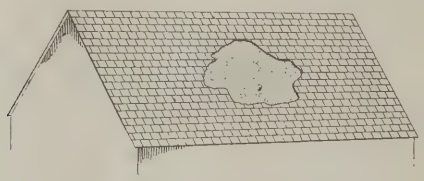


FIG. 3—HOLE IN SLATE ROOF

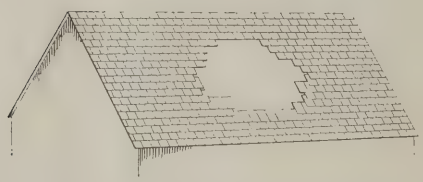


FIG. 4—BROKEN SLATE REMOVED FOR REPAIRS

ordinary way until good slate is reached, as will be noted in Fig. 4. Nail the last row close up to the butts a course above, as shown by dots in Fig. 5, and cover nail heads with putty, or, better yet, make a cement as follows, as it has been used for years with best results: Thin oxide of iron to a dry paste with coal tar. Thin this to the consistency of putty with boiled linseed oil. Leaks have been stopped in the bottom seam of large water tanks with this combination used continually where needed. When a leak occurs in the body of a roof and its precise location cannot be determined, strips of well-painted roofing tin may be slipped under the slate reaching from the bottom to nails a course above. Apply these strips 5 to 6 in. wide under the seam for a considerable area, and they will probably stop the leak.

In renewing roof gutters remove the second or third row of slate with ripper and proceed the same as for repair work, valleys in like manner.

The highest part of the house roof is the deck and is readily observed from almost any angle, usually covering the center of the building. It should have special care in its construction. It should not be a flat, unsightly object, with the tin roofing on a level with the top of the slate. It should be raised at least from 4 to 6 in. above the top of the last course of slate, as shown by Fig. 6, and have the sheeting project a proportionate distance over the facia to give it a neat appearance. The metal flashing may be close nailed at the top, or, if preferable, it may extend up the facia to a distance that will allow of the molding around the deck to cover it, making a proper and safe finish for that edge. The bottom or slate flash should extend over the end of the next to the last row and be completely covered with the last row of slate, invariably a narrow one.

The section *A* of Fig. 6 is a narrow one between a hip and valley requiring care and perfect workmanship on the latter side, also wide sheet metal lining, preferably copper 20 in. in width. If a cornice or roof gutter is built in and the roof is one-quarter or less than one-third pitch, a tapered extension is advised on each side of the valley at the lower end using a 28-in. sheet cut diagonally 5 x 15. This will prevent danger from back seepage at the valley in case of a freeze and thaw or drifting snow.

Around chimneys or other brick work where flashing is required, there should invariably be counterflashing, as shown on chimney, Fig. 1. Metal merely formed up and nailed against the brick and

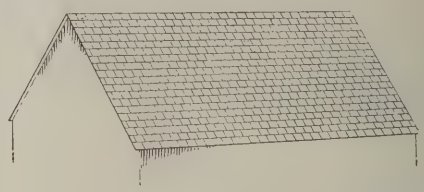


FIG. 5—NAILS THROUGH SLATE AT TOP FINISH

then cemented is not safe, as a slight shrinkage or settling of the chimney will loosen the nails, break the cement joints and cause a leak.

In Fig. 1 is also illustrated the taper work by means of which the steeple on the front of the roof is covered. As this character of work is very tedious, with wastage and continuous cutting, there is no fixed rule to meet the case. One foot extra added for hips will not total as large as to count each side of the octagon straight from the bottom up, as is the practice with many contractors that have been met. A few years since an octagon steeple was covered using small slate. It was 3 ft. 8 in. at base and 4 in. at the top and 21 ft. high. The actual surface for each section is 42 ft. and 21 ft. added for the hip makes 63 ft., and for eight sections makes a total of 504 ft. However, by calculating 3 ft. 4 in. at the base and straight for 21 ft., it will total 77 ft., or eight sections 616 ft.

The better policy for work of this character is the time and material plan. The builder then gets what he wants and the roofer gets his pay without

a gamble for either. Small ridge roll is used over each hip and painted the color of trimming for the building.

The finial for the top may be a cross or ball of size required, and may be bought at any cornice works.

The apparent indifference of a majority of the roofing trade and sheet metal workers to this class of work has been discussed. It belongs to them by the usage of custom long years gone, and in the East, or as far west as Indiana, it will be found that roofers and tinners generally keep slate in stock. However, in the great number of towns outside of the larger cities coming under my observation in Illinois, I have yet to see the first dealer keeping any one of these several styles of shingles in stock. It appears they are all laboring under the illusion that the freight is too high to admit of their being used. One case in particular will show the fallacy of this idea.

Some years ago while working at Easton, Ill., I tried to prevail on the hardware merchant and contractor, my employer, to get in a car of slate and advocate its use for roofing. Eventually he did order a car, part of which was for his own house. The local builders seeing that roof on the building had their contracts changed from pine shingles to slate, and were perfectly willing to pay the slight advance in cost, and a slate roof in that neighborhood is no uncommon object now. This dealer's roof, however, was the first ever laid in that town or locality. It is simply a matter of getting a start. Get prices of slate delivered from a slate manufacturer and you will know what you can do in your own town.

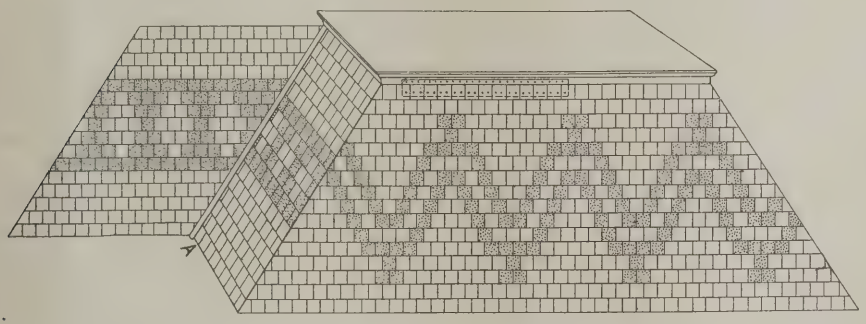


FIG. 6—DESIGN WITH DECK FLASHING

I have been asked time and again by building contractors to give the addresses of responsible slate quarry men, and in this I believe lies the crux of the matter.

In my humble opinion the slate manufacturers do not make the effort they should to encourage local dealers. They do not advertise as they should. They certainly do not go into advertising to advance trade, as the National Association of Sheet Metal Contractors does for sheet metal roofing or the Warm Air Furnace Association does to advance the sales of that particular product.

When local "would-be" slate roofers do not know where to write for prices and information, it surely does not look bright for an extension of that line of endeavor. Slate manufacturers are as keen business men as engage in other vocations, and without a doubt if they let more daylight into the business, giving publicity with the zeal and assiduity they are capable of giving, there would be a vast increase of business, especially in Illinois. There I more fully understand local conditions than I do those prevailing elsewhere.

In conclusion of these articles, I will say that in order to get a start in slate roofing, nearly forty years ago in Ohio, I contracted for slate roofing for two new buildings at a fair price, also the tin work. I gave over the slate work to good, practical slate roofers at the price I was to receive, and in addition agreed to help lay the slate, which gave us two practical lessons in slating and the profit on the tin work.

METHOD OF CONSTRUCTING CONCRETE FOUNDATIONS

The rapidly growing popularity of concrete foundations for buildings of all kinds renders of more than ordinary interest a brief description of successful methods of doing the work and in this connection we present some particulars of the scheme used by a Chicago firm of contracting builders which has for many years confined itself exclusively to this class of work. The success attained by this firm, F. Johnson & Co., is said to be due in great measure to a constant striving for more simplified and efficient methods. This has been accomplished by encouraging employees to make suggestions and by alertness in taking advantage of every idea which could contribute to greater economy of operation. Among the greatest savings effected are: rapid delivery of material with large motor trucks; greatly simplified forms, requiring very little lumber; and making a careful study of non-freezing compounds, permitting the laying of concrete in cold weather with results that enable them to guarantee the quality of concrete to equal any laid in summer.

The company uses sectional wood forms for constructing practically all basement walls that are 9 ft. or less in depth. These forms vary from 3 ft. 6 in. to 4 ft. 6 in. in width and from 4 ft. to 9 ft. in length, depending upon the requirements of the foundation. For building basements requiring a greater depth of forms than 9 ft. it has been found more practical to construct special forms of loose lumber. These are erected in the required positions on the foundation.

When using the built-up sectional forms the concrete footings are first put in. The forms for the outside of the walls are then first set up; but, before erecting a form section, strips of 28 gage hoop steel, about 1 in. wide and of sufficient length to nail to the outside of the frame of the outer form,

extend across the wall and permit nailing to the inside of the frame of the inner form, are nailed at the bottom of the frame. When the inner forms are set up, by placing wood wall gages between the side forms at the bottom, drawing the steel hoops taut and nailing them on the inside of the frame of the inner form, the lower part of the forms are securely held on the footing. At intermediate distances between the bottom and top of the forms wood wall gages are inserted and the forms wired together, the wires extending around the lateral bracings of the forms. At the intersection of forms the sections are tied together by diagonal wiring. Adjacent forms are nailed together through the side frames, the nails used for this purpose being of sufficient length that when driven to the heads the points protrude on the opposite side a considerable distance. This method of nailing affords great holding strength and permits driving back the nails when it is desired to remove the forms without injury to the frames. At the top, the forms are held by U-bar hoop steel nailed to the outer sides of the forms on either side, similar to the method of holding the forms at the bottom.

When these forms are properly set up, with sufficient wood wall gages, wired, nailed at the intersections and secured with the steel hoop bands at top and bottom, the entire construction is very rigid and only a small amount of bracing on the sides is required to steady the forms against shock.

The company owns a number of motor trucks in which all of its material is delivered. These include four Moguls and one Sterling.

The work of erecting forms and placing concrete begin practically at the same time and on many foundations of moderate size a skilled crew are able to erect all forms for the basement walls in a few hours.

Many years ago this company learned the economy of a portable mixer which could be moved along as the work progressed and which permitted spouting a large part of the concrete directly into the forms. This led to their adopting the Standard low-charging mixer for all of their operations.

A study of the methods of this company shows the efficiency which makes large achievement possible. The quick delivery of material, the small amount of bracing required for the forms, the carefully constructed sectional forms so erected that they can be quickly taken down without injury and repeatedly used, and the portable mixers requiring least handling of concrete, are features worthy of careful study by every contractor engaged in foundation work.

ANCIENT PROPORTIONING OF STUCCO

The proper proportioning of stucco ingredients, especially of the lime and cement, is a subject of much discussion and hardly any two plasterers combine them in the same proportions. This seems to be a matter that has always been in debate and even as long ago as the Middle Ages, says A. W. Jackson in an exchange, we find masons commonly mixing such things as ox blood, beer, dung, sugar and milk with their lime.

The accounts for the repairs of the steeple of Newark Church in 1571 contain an entry, "6 strike of malt to make mortar to blend with ye lyme and temper the same and 350 eggs to mix with it." During the building of the Duke of Devonshire's house at Chiswick, the interior of which was stucco, the surrounding district was impoverished for eggs and buttermilk to mix with the stucco.

It used to be a common practice in our southern states to mix molasses with the mortar. The object of most of these admixtures was to retard the set in order to secure more ease in manipulation.

It is a curious thing that a scientific formula to give the best results has never been promulgated, or at least never adopted. * * * It does seem strange that among the really expert men of established reputation who have done quantities of work, and have years of experience behind them, there should not be a common formula which the consensus of opinion would accept as the best.

ENTRANCE DETAIL OF AN ATLANTA HOUSE

ARCHITECTURAL TREATMENT OF AN EXTERIOR SHOWING A GOOD COMBINATION OF MATERIALS

THE picture shown on the opposite page, representing the main entrance of an attractive home in the Southern city of Atlanta, is an interesting example of the use of different materials in the same structure. The lower story has been laid up of rough field stone with pointed joints, while the upper story and gable end over entrance is in imitation of English half-timber work. The spaces between the timbers, as expressed by the wood in the construction, are of cement smoothly troweled and stained to correspond with the color of the woodwork—a nut brown—to contrast with the blue grey of the stonework below it. The barge boards and brackets are of wood, the dormers of cement. Capping all, the roof is laid with slate shingles, exposed 3 in. to the weather.

Exterior construction of this nature provides good protection from fire, and, as this house is located in the suburbs, where fire-engine service is not quickly available, it presents an example of building that can be followed with satisfaction.

The suggestion of half-timbering is interesting,

not only because it has been well designed and in good proportion, but also as it revives a memory of an early and at one time much-used type of construction. Its decorative value is unquestioned, but as the stones, or "nogging," that were used to fill the spaces between the timbers could not be laid sufficiently close at all times to exclude the weather, it at last gave way to the shingle or clapboarded house so popular in many sections.

The architects of the house were Hentz & Reid, with offices in the Candler Building, Atlanta, Ga.



DETAIL OF THE MAIN ENTRANCE OF A HOUSE IN ATLANTA, GA.

EFFICIENCY IN THE PAINTING BUSINESS

One of the papers read at the thirty-second annual convention of the New York State Association of Master Painters and Decorators held in Rochester was on the "Efficiency in the Painting Business," by D. J. Donovan of Buffalo. In summarizing what constitutes efficiency in the business, he says: First—System in buying materials. Second—Laying out work, placing and handling of men. Third—Estimating work. Fourth—Cost accounting. Fifth—Overhead expenses and Sixth—Service.

A FOUR ROOM HOLLOW TILE SCHOOLHOUSE

DETAILS OF THE DESIGN SHOWN ON THE COLORED COVER—SOME FIGURES OF COST

THE design which appears upon our front cover this month relates to a moderate-sized town schoolhouse having a capacity for 120 pupils divided into four classes. A board room is found on the upper floor which, however, can be utilized as a classroom should the exigencies of the case demand. It will be seen from an inspection of the floor plan that the hall or corridor extends entirely through the building, the double windows at the rear lighting the platform of the main stairs. The seating arrangement in the several classrooms is such that the light, which is amply provided by means of the numerous windows, comes over the left shoulder of the pupils. The architect points out that should it be desirable so to do, folding doors may be constructed between piers, creating an assembly room 30 x 50 ft. in size. The design calls for a fireproof structure, with the exception of the roof, but this can be so rendered if desired. The clothes dressers are provided with sliding doors and each schoolroom has ample blackboard space.

ARRANGEMENT OF BASEMENT

The basement of the building accommodates separate toilets for boys and girls, also washrooms opening into a common playroom which is intended to be used during inclement weather. The basement plan shows the position of the boiler room, coal bunker and janitor's quarters. The stairway can be constructed with cast-iron treads and steel frame, or of reinforced concrete, according to preference.

According to the architect's specifications, the basement is to be 7 ft. in the clear, and the foundation walls are to be of concrete, 12 in. thick, resting on a spread footing 12 in. thick projecting 6 in. on each side of the foundation wall. The concrete walls are to be carried up to a level of the first floor, which is to be constructed of reinforced concrete 6 in. thick, reinforced with ⅝-in. rods spaced 6 in. on centers and extending across the narrow way of the building. Reinforced posts are to be set on piers in the basement and to carry girders of reinforced concrete, a detail of which is shown on a following page.

EXTERIOR WALLS

The exterior walls are to be composed of 8-in. hollow tile, while the interior partitions are to be of 3-in. hollow-tile blocks, plastered both sides. All exterior walls are to be covered with two-coat stucco-work with "pebble dash" finish.

The upper floor is to be of reinforced concrete supported on girders, posts and the main walls. A frame plate composed of two pieces of 2 x 4 is to be securely anchored by bolts to the hollow-tile walls, and the framing for the roof is to be securely bolted to it, all as shown in the details presented on the full page of constructive features.

THE ROOF FRAMING

The roof framing is to consist of 2 x 6-in. rafters placed 20 in. on centers and bolted and spiked to the wall plate. The ridge is to be 1¼ x 10 in. The dormers are to be framed into the roof, as shown on the various elevations presented on the facing page. The roof is to be sheathed with ⅞-in. boards, over which is to be placed a layer of heavy building paper, and this in turn covered with fire-resisting shingles or slate, according to preference.

The floors are to be constructed in the rough, as intimated above, and 2 in. of cinder concrete laid with wooden sleepers 2 ft. 6 in. on centers, to which is to be nailed a tongued and grooved maple floor. The base is to be of wood 8 in. high. The blackboards, where shown on the floor plans in each of the four rooms, are to start 1 ft. 6 in. from the floor and extend to a height of 6 ft. above the floor. The cornice returns, moldings, etc., are to be of plain, neat pattern, with brackets at the entrance, as shown on the front and side elevations. The material is to be 1-in. white pine or cypress, according to preference, and mitered at the corners. All sash is to be double hung, and divided as shown on the elevations. The doors are to be of the built-up type, with oak veneer on a white-pine core.

All interior walls, surfaces, above and around the blackboards, ceilings, etc., are to be plastered, two-coat work with hard white finish.

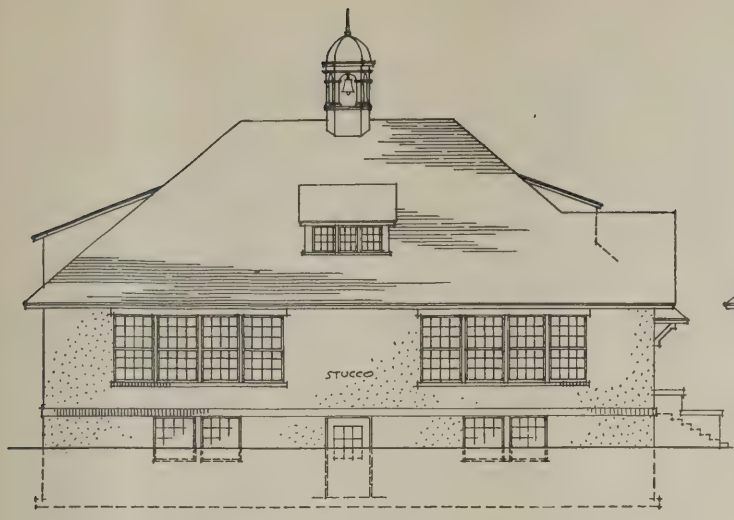
THE PLUMBING

The plumbing fixtures for the toilets are to be provided as indicated on the foundation plan, and are to be properly vented and trapped. The main supply pipe is to be 1-in. diameter and the branches ⅝ in. diameter.

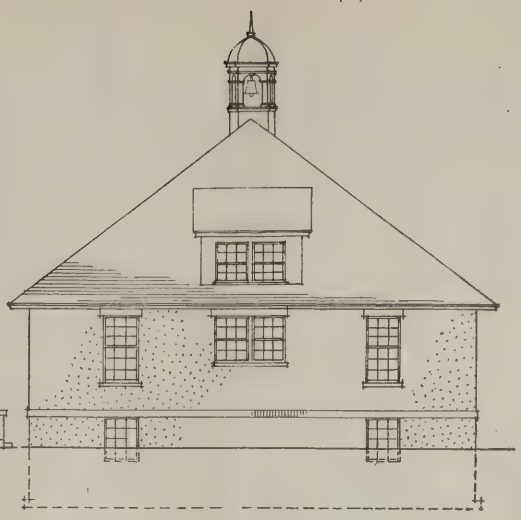
The main soil pipe is to be 4-in. extra heavy cast iron, and the vent pipe to be 3-in. cast iron, and terminate 4 ft. above the roof. There is also to be a fresh-air inlet at the front of the building.

The entire basement floor is to be of 3 in. of concrete with a 1-in. cement finish, and graded to the catch basin shown on the plan.

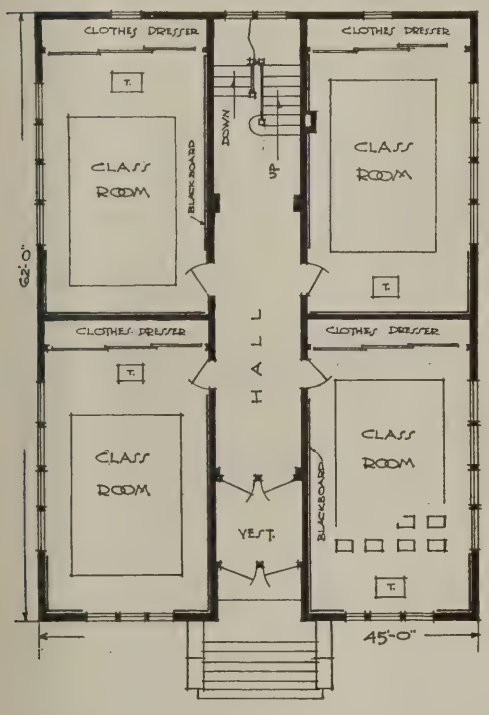
The building is to be heated with hot water or steam, as may be preferred. The position of the boiler or heater is indicated on the foundation plan, and there are to be provided all appliances and appurtenances for a complete heating plant. This includes sufficient radiators in all classrooms, placed under windows, also in hall and board room, the system to be complete in all details and guaranteed to furnish a temperature of 70 deg. throughout the



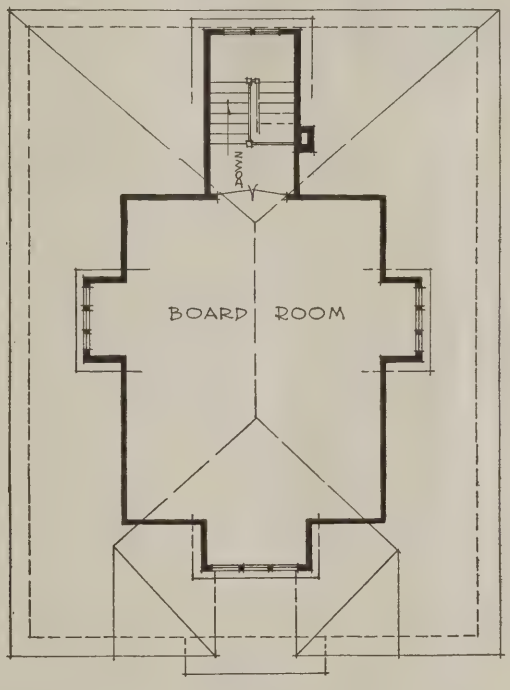
SIDE ELEVATION



REAR ELEVATION



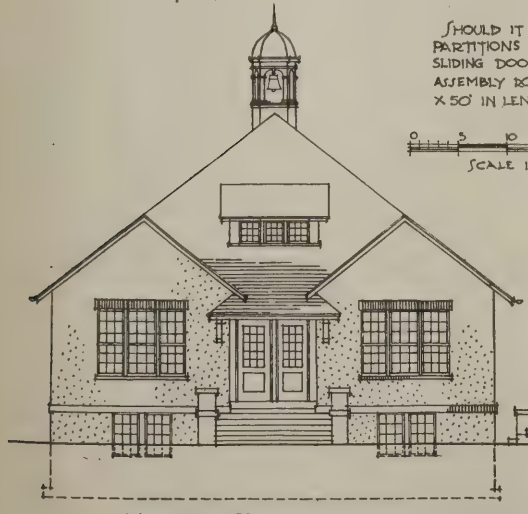
FIRST FLOOR PLAN



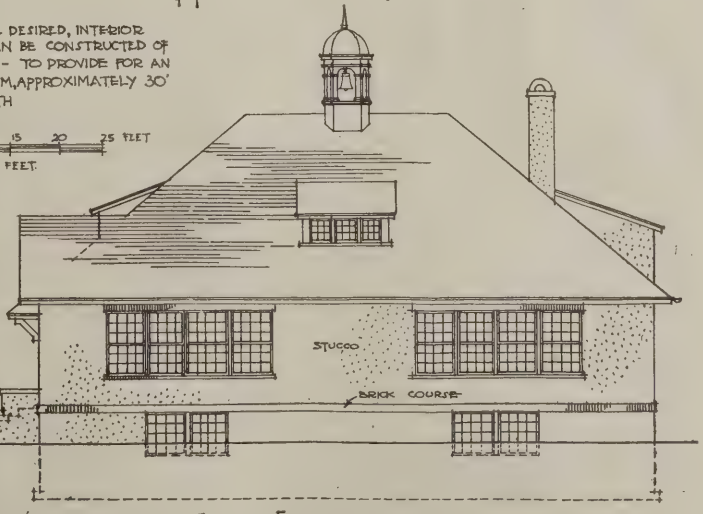
UPPER FLOOR PLAN

SHOULD IT BE DESIRED, INTERIOR PARTITIONS CAN BE CONSTRUCTED OF SLIDING DOORS - TO PROVIDE FOR AN ASSEMBLY ROOM, APPROXIMATELY 30' X 50' IN LENGTH

0 5 10 15 20 25 FEET
SCALE IN FEET



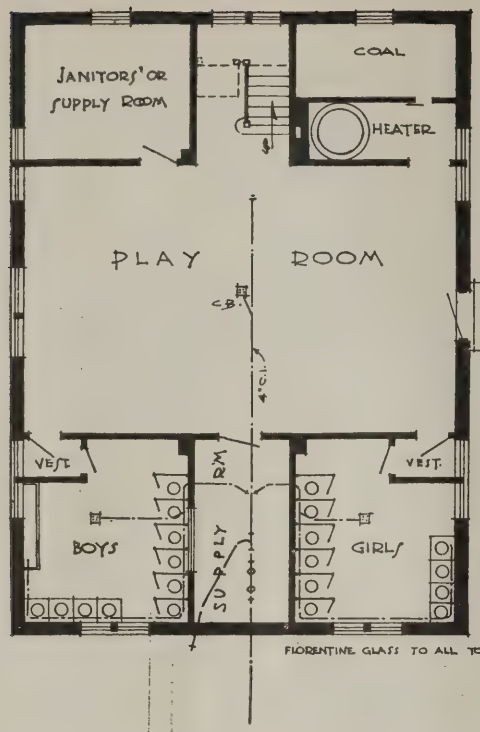
FRONT ELEVATION



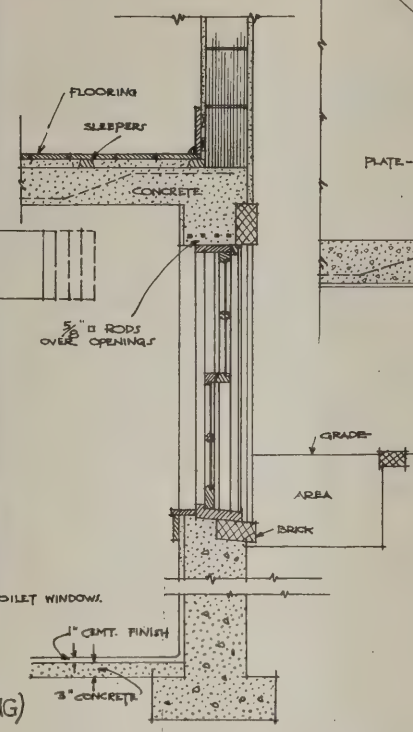
SIDE ELEVATION

FRANK T. FELLNER - ARCHITECT

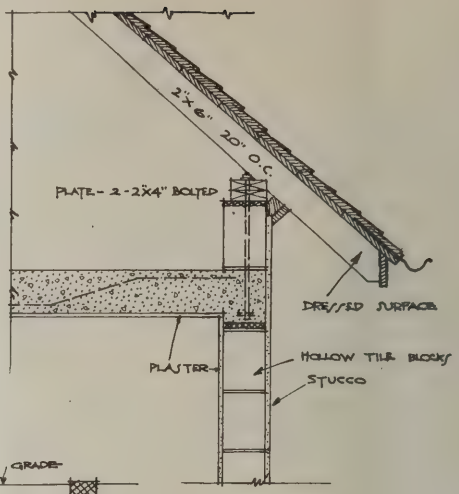
PLANS AND ELEVATIONS OF SCHOOLHOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE



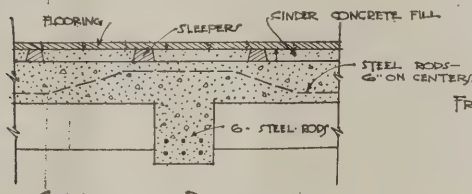
BASEMENT PLAN (SHOWING PLUMBING)



WALL CONSTRUCTION WITH BASEMENT · WINDOW

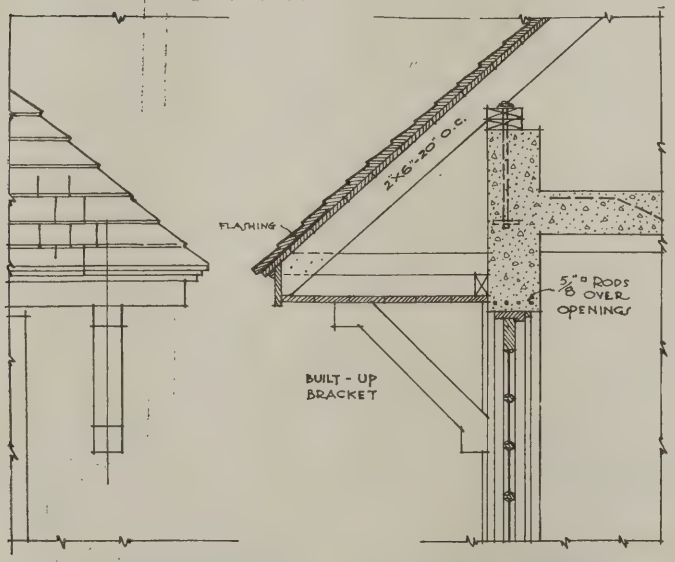


WALL · SECTION SHOWING ROOF

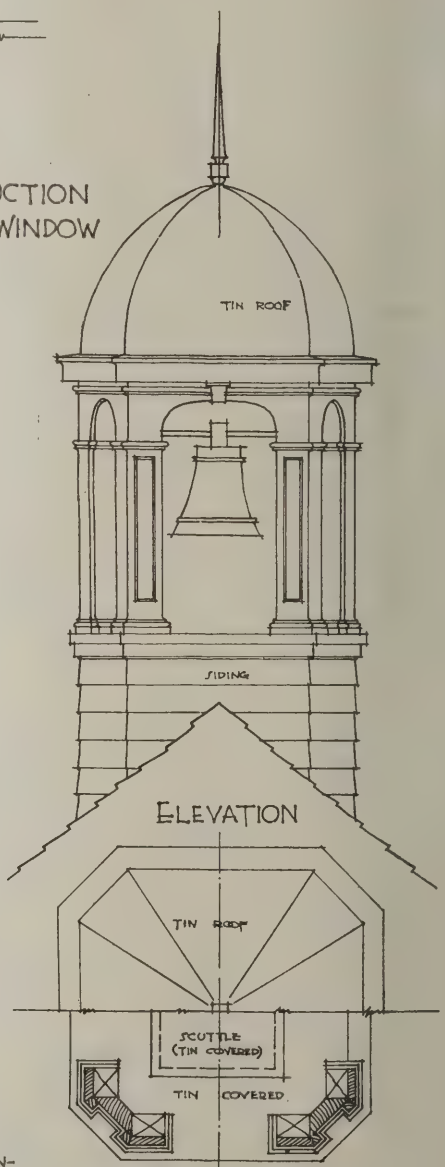


FRANK T. FELLNER ARCHITECT

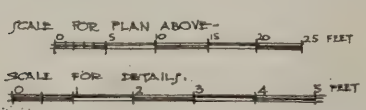
SECTION OF REINFORCED CONCRETE GIRDER



ELEVATION SECTION · DETAIL OF ENTRANCE HOOD ·



- HALF PLAN OF ROOF & BASE DETAIL OF CUPOLA ·



NOTE - CUPOLA TO BE CONSTRUCTED OF FRAME, AS SHOWN. FRAME POSTS TO BE FIRMLY BOLTED AND FITTED TO ROOF FRAMING. WHERE BASE OF CUPOLA MEETS ROOF - IT IS TO BE FLASHED WITH TIN.

MISCELLANEOUS DETAILS OF SCHOOLHOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE

building when the temperature is zero outside.

All exterior trim is to receive three coats of paint of a pearl gray color. The interior trim is to be filled and varnished.

The roof ridges, valleys, etc., are to be flashed with best grade tin painted both sides before laying. Leaders and gutters are to be galvanized iron, painted. The leaders are to empty outward on the ground.

A bell is to be provided and set in the cupola, with stout rope connection down to the main hall.

The architect estimates the cubical content of the building here illustrated and described to be approximately 72,540 cu. ft., on which he places a unit cost of 20 cents per cubic inch. Some of the more important items of approximate cost are $6,240 for masonry, concrete, hollow tile, etc.; $2,800 for millwork, carpentry, etc.; $1,450 for plumbing; $750 for heating; $500 for painting; $300 for hardware; $1,600 for gas and electricity; and $400 for metal work embracing flashings, leaders, gutters, etc.

The four-room schoolhouse here shown was designed and specifications prepared by Frank T. Fellner, 413 Caton Avenue, Brooklyn, New York, or care of the BUILDING AGE, 243 West Thirty-ninth Street, New York City.

MODEL REINFORCED CONCRETE TENEMENTS

AN INTERESTING EXAMPLE OF HOUSING ACCOMMODATIONS THAT IS ATTRACTING MUCH ATTENTION

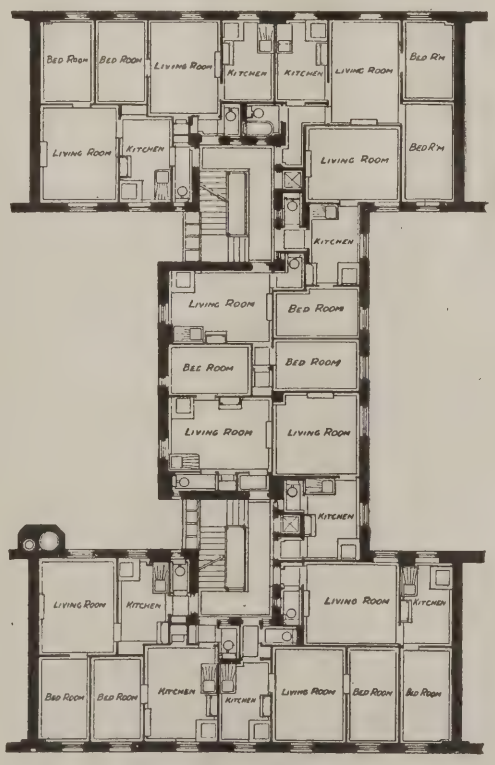
THE two units of the model concrete tenement building recently completed on the west side of Logan Street, midway between Findlay and Elder Streets, Cincinnati, Ohio, have aroused considerable interest as the use of reinforced concrete construction for this type of building was a new departure. It has, however, proved entirely successful, not only from the viewpoint of economy of space, but is said to be cheaper than structural steel columns and beams, with hollow tile and concrete joist floors.

The plans for these model tenements were drawn by William Emerson of New York City, who has made a study of tenement construction. Five other units are planned for the near future. The land for these has already been purchased. These seven units when completed will represent an investment of approximately half a million dollars. The work was done by The Ferro Concrete Construction Company of Cincinnati. The structural columns, beams and floors are of reinforced concrete.

The designs called for reinforced concrete columns and girders with slabs of solid concrete for the shorter spans and ribbed concrete with metal lath ceilings for the longer ones. Some of the latter spans are approximately 24 ft. The ribbed concrete slab construction has been developed by this company for use in cases similar to those where metal cores are frequently used. This overcomes considerable objections made to metal cores, one of the principal ones being that they do not permit the inspection of the concrete. Furthermore, if they rust they are likely to stain the plaster. With the "ribbed" system these objections are met because the form work is entirely removed after the construction is completed. The form work for the ribs is the same as that used for flat slab buildings.

A further advantage of this system is very low dead weight. This was particularly desirable in these new apartments as it was necessary to keep the column sizes down to a minimum since it was first intended to use structural steel.

The ingenious way that they are planned is further shown by the accompanying floor plan. This shows the arrangement for all but the ground floor. On this floor there are but nine apartments instead of the eleven shown. In place of the two apartments there are public baths and showers, and an office for the superintendent of the building. Be-



A TYPICAL FLOOR PLAN

sides the modern heating system in each apartment there is a gas stove and other necessary conveniences. Screens are supplied for all windows. The children throughout each tenement have the advantage of a well-equipped playground and nursery on the roof.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

JUNE, 1917

CONCERNING OUR BOOK DEPARTMENT

While the publishing and distribution of books pertaining to the field covered by the BUILDING AGE has been a distinctive feature of our work for many years, we have frequently had impressed upon us the fact that book-making was a business in itself, and one that could be pursued with greater advantage both to ourselves and to our customers if conducted independently. With this thought in mind the United Publishers Corporation has just completed the formation of the U. P. C. Book Company, Inc., with offices at 241 to 249 West 39th Street, New York, and to this new organization we have now transferred the business of our technical book department. Not only will this new company be in position to avail itself of the facilities and technical knowledge possessed by the staff of this publication and heretofore utilized by our Book Department, but in addition will command the services of men experienced in the technical and trade book publishing field, whose knowledge will enable it to furnish greater and fuller service to its customers than it is possible for any book department to render, conducted as a mere adjunct of a periodical. We bespeak for U. P. C. Book Company a continuation and extension of the patronage heretofore accorded this department of our business.

PLAN TO ELIMINATE STRIKES

A movement has just been inaugurated in the city of Oakland, Cal., which has for its purpose the elimination of strikes and lockouts and the establishment of industrial amity between employers and employed—a result greatly to be desired in these days of strife and contention. What is known as a Commonweal Committee of the Chamber of Commerce has been organized for the purpose, it being composed of four union leaders and five members of the Chamber of Commerce as representatives of the employers. A rather unusual fact in connection with the composition of this committee is that the union men insisted that they should be in the minority so that there should be no ground for the charge that they were attempting to dictate. The first task of this committee has been to arrange working conditions among the house carpenters, the bridge carpenters and the ship carpenters, this move having been made following the offer of Oakland to lay down one hundred wooden vessels in the government's shipbuilding program. The main purpose of the Commonweal Committee, which has been in process of formation for the last six months, is to endeavor to get back to first principles in industrialism; that is, revert to the days when the employer and employee were so close together that grievances could be threshed out man to man. The results of the work of this committee and of the general scheme itself will be watched with the deepest interest by all employers of labor the country over.

MAIL COST OF TRADE PAPERS

There is no trade paper in the country so devoid of patriotism as to desire to avoid bearing its fair share of the cost of administering the Government even in the time of the extraordinary war in which the United States is now taking part. With the assembling of Congress the question of the cost of distribution of second-class mail matter has again come up and the pernicious zoning system is again incorporated in the proposed legislation. While the man in the first zone might be able to get his paper at the present prices, those in the further zones could get their more needed trade assistants at a cost which, without any profit, would be three or four times the present price. Every reader is as directly concerned in this question as are those who publish trade papers. The publishers

are willing to bear their fair share of the war taxes. The reader, however, has been enjoying at the hands of the Government the distribution of his paper from the publication point to his home, wherever it may be, at a price without any discrimination. To him naturally falls the duty of protecting his interests by filing at once with his Congressional representatives his urgent personal protest against the proposed zoning system. It would be far better if the taxation was of one character and upon the profit of publications, as in other lines of industry, and without any raise in the postal rate, which is wholly inimical to the educational and commercial interests of the readers throughout the country.

OUTLOOK FOR BUILDERS' SUPPLIES

With a view to determining the question of supplies for builders conducting moderate-sized operations, the *Dow Service Daily Building Reports* made a canvass, about the middle of May, of the various stores out of which such builders supplies are furnished. It is stated that "there were fairly good stocks of steel on hand sufficient to take care of moderate-sized building requirements for the balance of this year at least. On orders for large buildings, which have to be rolled on specification at the mills, delays ranging from eight to twenty months, depending upon tonnage and specialization, may be expected, although new steel capacity is being rushed to relieve this pressure.

"The threatened engrossment of 1,500,000,000 feet of shipbuilding lumber is not a serious factor because it does not affect general building lines to an extent making for general stagnation in construction. The lumber trade looks for some further reflection from this demand as far as prices are concerned, but increased orders for terra cotta fireproofing material and other lumber substitutes are expected to further stimulate the tendency to proceed with small building operations running as high as six stories. Surveys of the suburban districts show that the big building movement of the hour is outside of New York City, where steel and metals constitute an important factor in construction. An important building material supply house has assurances that it is the disposition of the government not to check industry by stifling demand but to keep the materials going and to encourage realty interests to improve their property to help the national building industry meet its share in the financing of the great war."

DEATH OF GEORGE LANGFORD

George Langford, a veteran contractor of Portland, Oregon, died at his home in that city on April 11. He built a number of the large structures in Portland, including the First National Bank Building, the Hotel Portland, the Worcester Block, the North Head Light House and others.

WARNING

Many complaints have reached this office of non-receipt of copies of BUILDING AGE on orders given to agents claiming to represent us. Swindlers are at work throughout the country soliciting subscriptions for trade papers and offering papers at reduced rates and with premiums. We warn you not to give money to strangers unless they show credentials from this company direct (not agency credentials). Make your check payable to BUILDING AGE.

When in doubt, do not pay agent—wait until first copy is received and then remit direct to this office.

You will be aiding the members of your community if you pass this warning on to them.

ANNIVERSARY OF BRIDGEPORT MASTER BUILDERS

The Master Builders' Exchange of Bridgeport, Conn., celebrated its first anniversary on April 27. An excellent banquet was served and many interesting speakers were heard, among whom was George E. Crawford, president of the Chamber of Commerce. Mr. Crawford spoke of the responsibility of builders in erecting only substantial dwellings in a community, stating that it largely rests with them as to the quality of materials which are used, as the average property owner often knows nothing about these things and is inclined to seek that which is low in cost without regard to its permanent value in the building. He also encouraged the builders to seek the enactment of better building laws which would later undoubtedly rebound to their credit.

LUMBER PRODUCTION IN 1916

According to the figures compiled by the Forest Service, the total computed lumber cut for 1916 was 39,807,251,000 board feet. These figures are based on reports received up to April 15 from 17,201 saw mills out of 30,081 believed to have been operated last year. The state of Washington was the largest producer with a lumber cut of 4,492,997,000 ft.; Louisiana was second with 4,200,000,000 ft. and Mississippi third with 2,730,000,000 ft. Southern yellow pine constituted 37.6 per cent of the entire cut; Douglas fir ranks second and oak third.

CONTRACT FOR 1500 HOUSES FOR WORKING MEN

What is said to be the largest building contract for dwelling houses awarded in this country has been secured by Thompson-Starrett Company, New York City. The contract calls for the erection of 1500 houses for the Bethlehem Steel Company, 1000 to be built just east of Bethlehem, Pa., and 500 adjacent to South Bethlehem.

It is said that the first bricks made in England were manufactured in 1449, and before that time they were imported from the continent of Europe.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

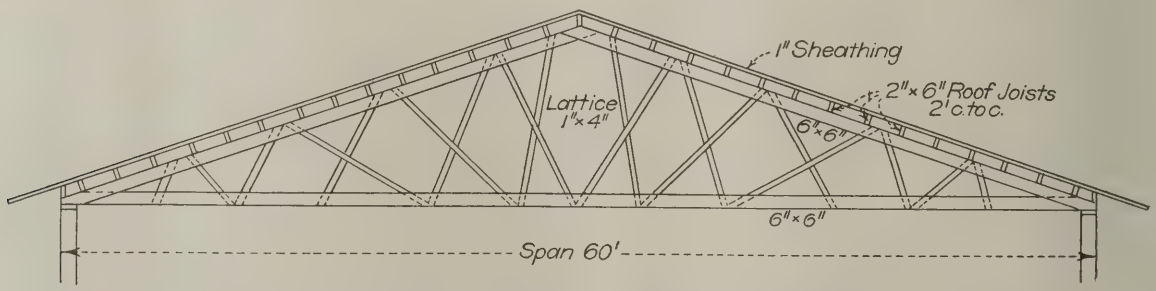
BRICK VENEER CONSTRUCTION

From W. P., Minier, Ill.—I have built several houses but never one of brick veneer and I am in need of some information as to various details of this class of work. Will practical readers who have had experience along this line show me by means of sketches the correct way to set the window frames; also the manner of building the porch. How are the window frames made and how are the joists of the porch supported?

I would also like to know in regard to drawing plans of houses, whether the measurements are taken from the outside of the brick work or from the inside of the frame.

SELF-SUPPORTING ROOF FOR GARAGE

From H. H. H., Picher, Okla.—I am interested in the discussion appearing in the April issue of THE BUILDING AGE relating to a truss for a self-supporting roof for a garage of 60 ft. span and am submitting a design for a truss which I regard as very good for the purpose. I had occasion to design one a short time back for about the span stated. The design submitted is a built-up lattice truss using 1 x 6-in. material for the main members and 1 x 4-in. for the lattice.



TRUSS FOR SELF-SUPPORTING ROOF OF GARAGE SUBMITTED BY "H. H. H."

No bolts are used. The tie and main rafters interlock and are nailed; the main rafters at the top also interlock and are nailed. The lattice pieces are inserted in the main members and nailed. Short pieces of the 1 x 6-in. material are used along the main members to fill the spaces between the ends of the lattice members. The main members are built up of six layers of 1 x 6-in. material to make a total width of 6 x 6 in.

I have analyzed this truss and it has everywhere a greater factor of safety than four in use in this roof with a span of 60 ft., placing the trusses 12 ft. apart center to center and allowing a load of 30 lb. per square foot of roof surface. In building this truss I would suggest that in starting to nail together the 1 x 6-in. pieces, small nails be used first.

I submit this design in hopes that it may be of service to some one in solving the problem. I think one common mistake is in getting the tie member unnecessarily heavy.

QUESTIONS IN HOUSE CONSTRUCTION

From John Upton, LaFargeville, N. Y.—I would like to say in reply to the questions of "H. W. S.," Duenweg, Mo., that he can build a good house if he follows the scheme which he outlines in his communication in a recent issue of the paper. I helped to build a house a few years ago 40 x 50 ft. in area and three stories in height, part of which was faced with stone, part with concrete blocks and one side was of solid concrete. The walls were from 22 in. to 14 in. at the top. The first step in doing the work was to set up 1 x 4's, spacing them 16 in. on centers so that the inner edge would come even with the inner face of the wall. This left them embedded in the concrete. The "form" boards were taken off after the walls were built. Furring strips were tacked onto the 1 x 4's and the walls were lathed and plastered. This left an air space between the concrete and the plaster with the result that the house was easily kept warm.

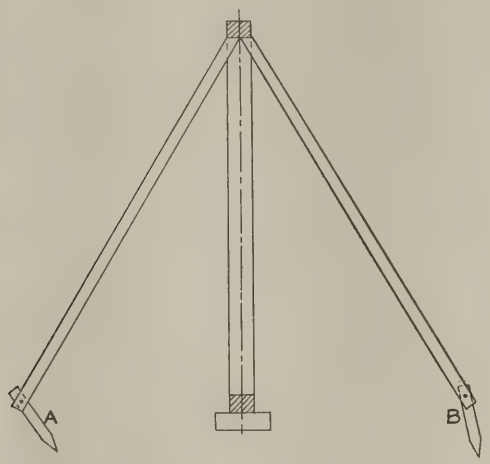
Door and window frames were put in as the walls were built, but possibly a better way would be to place rough frames of the proper size in the openings and then place and finish the frames later, they being so built that this could be done

without the necessity of removing rough frames.

I would suggest that under the conditions given by the correspondent, it might be well to build the porch floors of concrete as the materials could be readily obtained.

PLUMBING A BENT OF FRAMING

From T. H. A., Tacoma, Wash.—In carrying out the suggestion made by the editor in a recent issue for more correspondence on the part of the readers, a subject has occurred to me which might be



PLUMBING A BENT OF FRAMING

worthy of a few comments. I was plumbing a heavy bent one day when I found that the stakes I had driven as at *A*, to which to nail my braces, were in such soft earth that they would not remain exactly in place. My partner advised driving them, as shown at *B*, and this proved to work most satisfactorily. I then began to figure when to use stakes, as shown at *A*, and when as at *B*, and reached the following conclusions. When Ringling Brothers raise their big top the gun stakes are driven as at *A*. The strain is tensile and more or less varying. On the other hand, when a local bill posting company raises sign boards it always drives brace stakes as at *B*. The strain here is either compressive or tensile, according to the direction of the wind.

An engineer in setting up an instrument plunges the tripod legs firmly in the ground and they remain exactly in place. This last, wherein only the compressive strain is involved, corresponds to the stake at *B*. To an old experienced head the matter of how to drive a stake may be so much of a reflex action as not to warrant a thought, but as a beginner I find these little things which tend to develop the knack of the trade quite important.

SLEEPERS FOR WOOD FLOOR ON CONCRETE BASE

From E. H. B., Hampton, Va.—In a construction where timbers are embedded in concrete or cinder fill to serve as nailing strips for a wood floor (but before the floor is laid the timbers are covered with a damp proof paper), what would be the best kind of material to use for the nailing pieces? How can that material be protected from dry rot? Which material will last the longer in a place that is not ventilated, sap or merchantable yellow pine, or heart yellow pine? I shall be glad to learn what some of the older carpenters with longer experience have to say on this question.

I have three volumes of THE BUILDING AGE bound already and have four more ready for binding, and I consider them the beginning of a reference library of great value.

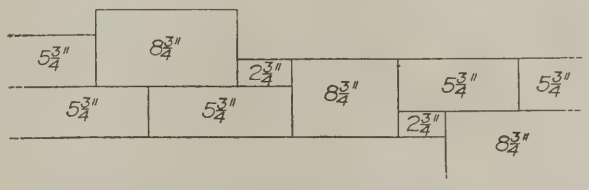
Note—In this connection the opinion of Prof. Woolson, consulting engineer of the National Board of Fire Underwriters, regarding the treatment of sleepers and floors is of value.

"Attention is called to the grave danger of dry rot attacking floor sleepers which are imbedded in concrete and then sealed from the air by the floor covering. Instances of rapid decay and serious damage from this cause are numerous. Well-seasoned heartwood timber is best suited for this purpose, and antiseptic treatment is recommended. Coal tar antiseptics are not suitable for this purpose in most buildings. The odor and the oily surfaces are disagreeable, and the danger from fire is increased. Wood treated with zinc chloride or corrosive sublimate is not subject to such criticism.

"Wooden floor surfacing should be made as waterproof as practicable. Waterproof paper is sometimes used between the layers of rough and finished flooring, but this increases the danger from dry rot, unless care be exercised to have the sleepers and rough flooring thoroughly dry before sealing it down with the paper. Antiseptic treatment is the most reliable."

A QUESTION IN RUBBLE STONE WORK

From G. J., St. Louis, Mo.—I am a regular reader of THE BUILDING AGE and have received from its columns valuable information concerning fireplace construction. I would, however, like to see more articles on stone construction, such as good snecked and squared rubble work. Pos-



QUESTION IN RUBBLE STONE WORK

sibly some of the readers would refer me to books on stone work, but I have been through every book on building construction and have never seen broken rubble work properly drawn out. The class of work I speak of has risers 8¾ in.; stretchers 5¾ in.; snecks 2¾ in. and two stones to make the height of the riser stone 8¾ in. I saw a building a number of years ago built like this, but can't remember how it was started, and I remember

the foreman said it was all in starting correctly. The accompanying sketch shows a part of a wall and I would appreciate receiving information from some of the readers.

INSULATION OF CANADIAN HOUSES

From W. M. L., Drummondville, Quebec, Can.—While at Drummond, a province of Quebec, Can., recently, and being interested in building con-

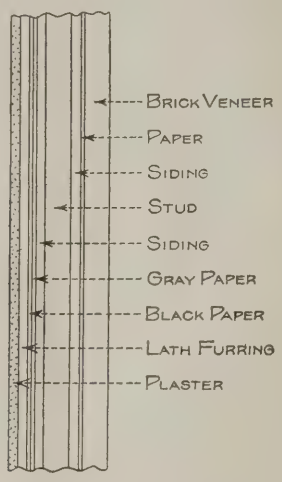


FIG. 1—VERTICAL SECTION THROUGH AN ENCLOSING WALL OF A CANADIAN HOUSE

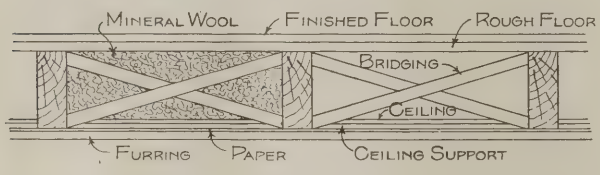


FIG. 2—CROSS SECTION OF THE FIRST FLOOR

struction, I utilized some of my spare time in going around and seeing how buildings were put up in this part of the country. I am inclosing herewith sketches showing in Fig. 1 the way in which the walls were constructed, and also indicating in Fig. 2 a cross section of the first floor. This is the practice followed in this province where, it must be recalled, some of the winter days experience temperatures ranging from 24 deg. to 30 deg. below zero. I am sending these sketches thinking they may possibly be of interest to some of the readers of the paper.

LAYING TARRED PAPER ON ROOFS

From R. R. W. Dayton, New York.—As being of possible interest I wish to raise the question, which is the better way to lay tarred roofing paper on roofs? When laid lengthwise of the building it cannot be stretched tight enough to lay flat. As a consequence, the wind is always blowing it up and it wrinkles so some claim that laying it vertically is the better way.

If it is laid horizontal with the roof, commence at the top and lay toward the eaves. In this way the top layer will have to be raised up to allow the edge of the next layer under, but it will not be continually walked upon and holes torn in it. On a large factory storehouse roof the foreman directed it be laid by cutting it into strips 8 to 12 ft. long, thereby being able to stretch it tighter although causing more joints.

SOME QUESTIONS IN FIREPLACE FRAMING

From E. G., Flint, Mich.—Can some brother chip give me some information concerning framing in connection with fireplace construction? I would like to know:

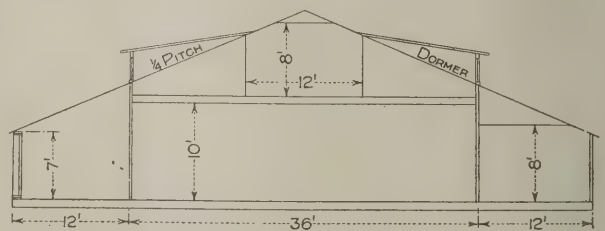
1—A good method of framing when the fireplace is located in an angle.

2—Some methods of framing when the fireplace is not placed in an angle, and an economical trimmer arch.

The reason I ask these questions is because the construction that I am using does not strike me as being particularly good and think that some of the readers may be able to give some good ideas in connection with fireplace framing, the same as they do along other lines.

NOVEL FLOOR PLAN ARRANGEMENT

From W. R. Graham, Architect, Cobalt, Ont.—Referring to the inquiry of "Diamond Room" which appeared on page 55 of the November issue of THE BUILDING AGE, I am sending a tracing representing a vertical outline through the building and clearly indicating what I regard as the cheapest style of roof. If properly constructed, it will make an attractive bungalow. The correspondent will note some changes, including the front porch 12 ft., kitchen 12 ft., leaving the rear porch 15 ft. There is plenty of head room for the stairs, and the second floor as per the ground plan of the correspondent



VERTICAL OUTLINE THROUGH THE BUILDING

and gives him two rooms in the attic 12 x 16 ft. There is also the advantage of a door from the balcony of the room over the bay window. There is also plenty of room for dormer windows on the roof, all of which may be of interest.

CONVENIENT SHOP OF BUILDING CONTRACTORS

From Anderson Bros., Litchfield, Minn.—Noting the apparent interest in shops operated by building contractors in various sections of the coun-

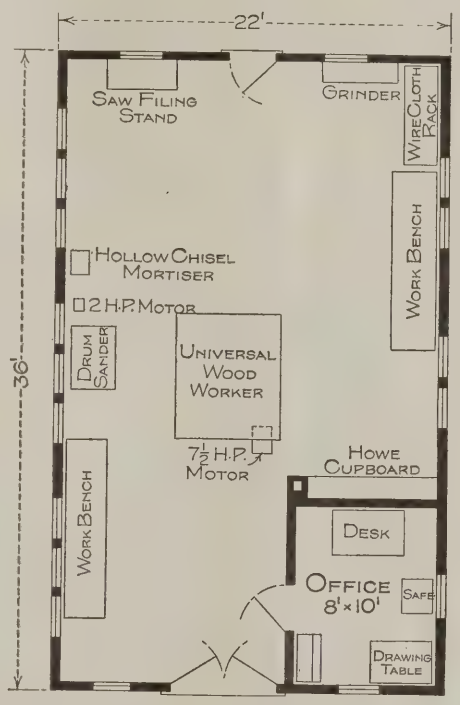
try, we are sending a picture and floor plan of the shop which we operate, the plan clearly indicating the location of the office, the work benches and the machines which we use. Our experience has been that it does not pay contractors to attempt to get along without a more or less well equipped shop. In the office near the window we have the drawing table so as to give good light to the work which may be upon it, also a desk, a safe, etc. The Sydney "Famous 31" Universal woodworking machine is placed about the center of the shop and the least we can say about it is that no one could take it out of our place for twice the price we paid for it if we could not get another machine like it. At the left of this machine is a drum sander beyond which is a hollow chisel mortiser and at the rear is a grinder and saw filing stand all as shown on the plan.

In addition to these machines we have an electric floor surfacing machine with 12-in. wide drum, also a Miller lock mortiser, both of which machines are great labor savers and would pay for themselves on a few jobs.

We have used a 10-hp. gasoline engine for the woodworker and a 1-hp. motor for mortising, grinding, etc. This past winter, however, we replaced the engine with a 7½ hp. electric motor. The latter power is slightly higher in cost but is so much more convenient that the difference in price is more than overbalanced.



Shop of Anderson Bros. at Litchfield, Minn.



Floor Plan Showing Layout of Machines

We have a portable saw rig which we take out on our jobs, it being one of our own make: that is we equipped it ourselves.

WHY DO WALLS OF HOUSE SWEAT?

From S. B., Weston, W. Va.—I would appreciate it very much if the readers would give me some information to enable me to prevent my house from sweating on cold nights. My house is off the ground about 3 ft., but is underpinned around. We keep the windows down from the top and keep a gas fire in the rooms. I have ventilators in the two rooms that sweat. It only comes through the roof part and not through the sheathing on the side walls which are plastered, as is also the ceiling. The sweating spoils all the paper we put on the wall. Any information will be appreciated.

Note.—Whether or not our views in this matter are correct, we do not wish them to hinder others who can give information from experience in coming to the assistance of this correspondent. Evidently natural gas is used for heating the rooms where the trouble occurs, and if there is not a good connection with the chimney to carry away the products of combustion, the water generated in the combustion of gas and which passes off with the products of combustion in the form of a vapor, will condense on the cold walls wherever it strikes them. A better chimney connection to draw off the spent gases will largely aid in the removal of the cause trouble. Again, it would seem that there is not sufficient air space between the roof proper and the ceiling to prevent a rapid waste of heat at that point. This may or may not aggravate the trouble. If it is possible to keep the room warm enough for occupancy, it would seem that the cold walls are not the cause of the trouble, but rather that there is an excessive amount of moisture generated in the combustion of the gas and no adequate provision for it to find escape. A better chimney connection may be the solution for the entire trouble.

QUESTION IN GIRDER CONSTRUCTION

From John Upton, La Fargeville, N. Y.—In regard to the question of built-up girder construction discussed in a late issue, I notice that it is suggested making the girders 10½ ft. in length and butting joints on the supporting columns. Personally, I do not just like the idea. The correspondent, "R. W. W.," shows girders resting on a cap on the posts and bolted to the cap by means of a rod. It seems to me this cap would be an improvement, but I should prefer to have at least

one of the four pieces of girder continue along across the post, so I would make one of the inside sticks at the end 2 ft. longer than the other. This would tie the building together lengthwise and it seems to me would give better results than butting the joints.

GETTING OUT HANDRAIL WREATHS WITH THE BAND SAW

From W. W., New York.—Some years ago I saw an illustration in THE BUILDING AGE showing how to get out handrail wreaths by means of the band saw. As my recollection of the method is somewhat hazy I would like to ask the readers if they would describe the plan which they follow. Possibly Morris Williams would be willing to say something on the subject.

SHOP OF AN ENTERPRISING IOWA CONTRACTOR

From J. E. Donaho, Milton, Iowa.—Referring to the illustrated description of my shop which appeared in the May issue of THE BUILDING AGE I desire to call attention to a slight error which it might be well to correct. In describing Machine No. 22 the text says it is a Sidney 5-in. jointer. It should read 8 in., as the Sidney Tool Company does not make this machine in 5-in. size; otherwise the article is O.K. and will, I hope, interest readers of the paper.

TROUBLE WITH SHRINKING DOORS

From W. W., New York City.—One of the troublesome things which one comes across in the building business is the shrinking door. I believe that there is some arrangement by which this can be overcome by means of an adjustable jamb. Can any of the readers give me particulars concerning it?

FORMULA FOR FROSTED AND SPOTTED OAK STAIN

From C. A. B., Highland Park, Mich.—I am a painter and subscribe to the BUILDING AGE, from which I derive a great deal of valuable help. I am in need of some further information, and therefore come to the readers for it. Will they tell me how to make a frosted and spotted oak stain?

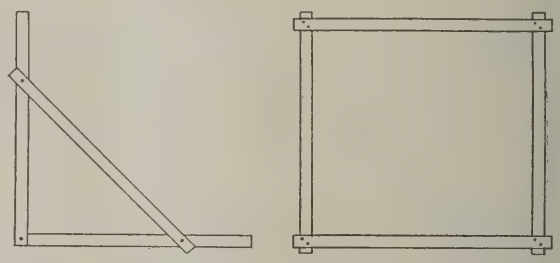
HOW TO BUILD A CONCRETE CHIMNEY

From E. R. N., Bound Brook, N. J.—There is a party out here who wants me to build a concrete chimney in a house he is going to erect. I have seen concrete chimneys with cracks in them and do not wish to run the risk of fire through my work. A good concrete chimney should be feasible, but I don't know how to make it right. Can some of the readers tell me the proper mix to use, outside and inside forms, the proper placing of any reinforcement required, the thickness of the outside walls and the flue partitions and all other matters which would be a great help to me as well as many other readers of THE BUILDING AGE?

PLACING EXTERIOR SHEATHING BOARDS

From T. H. A., Tacoma, Wash.—I will ventilate my views as requested by "Young Woodbutcher," Greenville, R. I., in regard to rough sheathing laid diagonally on floors and walls. Take three lath, tack them together in the shape of a triangle, as in Fig. 1, using only one lath nail in each joint. Next take four lath, as in Fig. 2, and tack them together in the shape of a parallelogram, using two nails in each joint. Now test the comparative rigidity of the two by racking them out of shape.

In lofty mill buildings of frame construction, it is essential to sheath diagonally in order to reduce sway and vibration to a minimum by carrying these reactions to the foundations. As the grade of sheathing is usually cheap and of varying thickness, finish flooring and siding rests on it more smoothly when it is laid diagonally than when the finish and rough are parallel, to say nothing of shrinkage cracks which are liable to develop.



FIGS. 1 AND 2—LATH MODELS TO TEST THE RIGIDITY OF A FRAME SHEATHED THE TWO WAYS DESCRIBED

From a constructive standpoint I think it does not admit of argument that diagonal sheathing is better than horizontal, but since the labor item for diagonal is generally twice as much as for straight, Mr. Money, the greatest linguist in the world, has a few words to say and he alone is responsible for there being two methods of placing rough sheathing.

HOW THE JAPANESE DRAW PLANS

The Japanese draw their plans on one sheet of paper and then they fold it all down so that it is flat, says William A. Boring. When it is shown to the client, who has no imagination about mechanical drawing, the architect lifts up the side walls and puts the roof over the top. It is all drawn out and the client can look in the window and see the inside, or put it on the table and see what it looks like on the outside. It appeals to the imagination of people who are not educated to the building plan.

COMPLICATED FRAMING OF CHURCH DOME

AN INTERESTING EXAMPLE OF WORK WHICH THE BUILDER OCCASIONALLY HAS TO PERFORM

IT'S a far cry from the primitive, unheated, "square as a brick" structure, with a steeple perched on one end, to the modern, up-to-date, comfortably heated and upholstered building, with its complete facilities for serving the spiritual and social needs of its members. And incidentally the development of the church building has not more than kept pace with that of the increasing variety of the kinds of service that the present-day church finds itself called on to render the community, and for which provision must be made in the modern church "plant." Perhaps there is no better example of the modern church edifice and the care taken to provide for housing all the church's varied activities than the new home just completed by the First Methodist Church of Tacoma, Wash.



PICTURE OF THE CHURCH, THE DOME OF WHICH INVOLVES IN ITS CONSTRUCTION THE PECULIAR FRAMING HERE DESCRIBED

The building, which occupies five city lots at the corner of South Fifth and K streets, and is 125 x 130 ft. in size, was erected from plans furnished by Fulton & Butler, architects, Uniontown, Pa.

Advantage was taken of the natural slope of the ground to provide a full basement, well lighted by daylight on all four sides, the main noor being only a few steps above the street level on K Street, and the basement floor being entered from the street level at the side on Fifth Street, while a sub-basement 40 x 60 ft. under the alley side of the building is also well lighted and only a few steps below the alley level. This sub-basement affords ample room for the heating and ventilating plant, fuel room, etc. The heating and ventilating plant is of a capacity to completely change the air in the auditorium every fifteen minutes, and combines both direct and indirect radiation. It is evident from the care taken to provide ample ventilation that the pastor of this church will not have to contend with the somnolent effects of impure air on his congregation.

The main auditorium has a seating capacity of 700 on the main floor. The balcony directly opposite the pulpit seats 200, the choir loft 50 more, and the chair space inside the altar rail an additional 200, making 1150 in all. The Sunday-school rooms at the left of the main auditorium, and a partial view of which is shown in the interior view, are separated from the auditorium by accordion-hung doors—shown open in the picture—and contains besides the assembly room nine class rooms on the first floor and eight on the second floor opening from a balcony, part of which appears in the picture. These will seat 700 within sight of the pulpit and an additional 350 within easy hearing

distance but not within sight of the pulpit, giving a total seating capacity of 2150. The acoustic properties of the building are so perfect that any ordinary speaker can easily be heard in any part of the auditorium or Sunday-school rooms.

Provision is made on the main floor for the pastor's study, choir room, and also for the Women's Club room with kitchenette adjoining for the convenience of the various women's societies connected with the church. This kitchen is a feature.

The basement floor opening from Fifth Street, and which is practically all above ground and day-

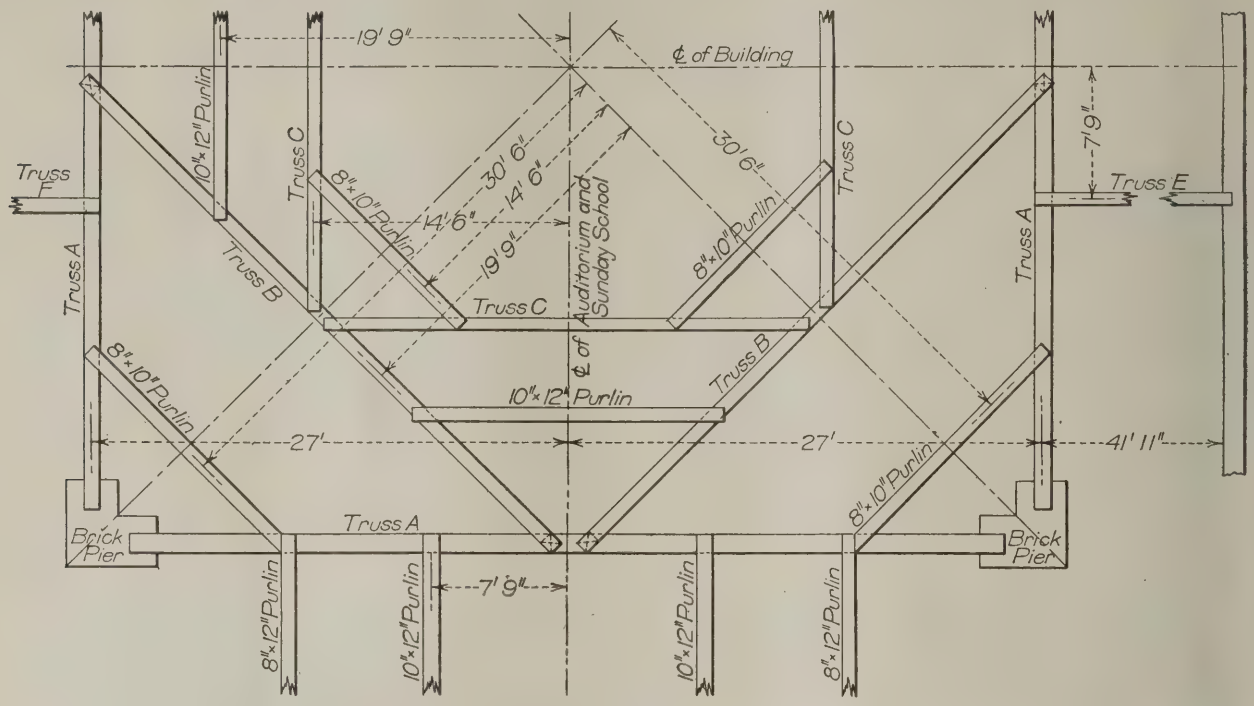


FIG. 1—HALF PLAN OF ROOF TRUSSES AND PURLINS, SHOWING SIZES OF FRAMING MEMBERS

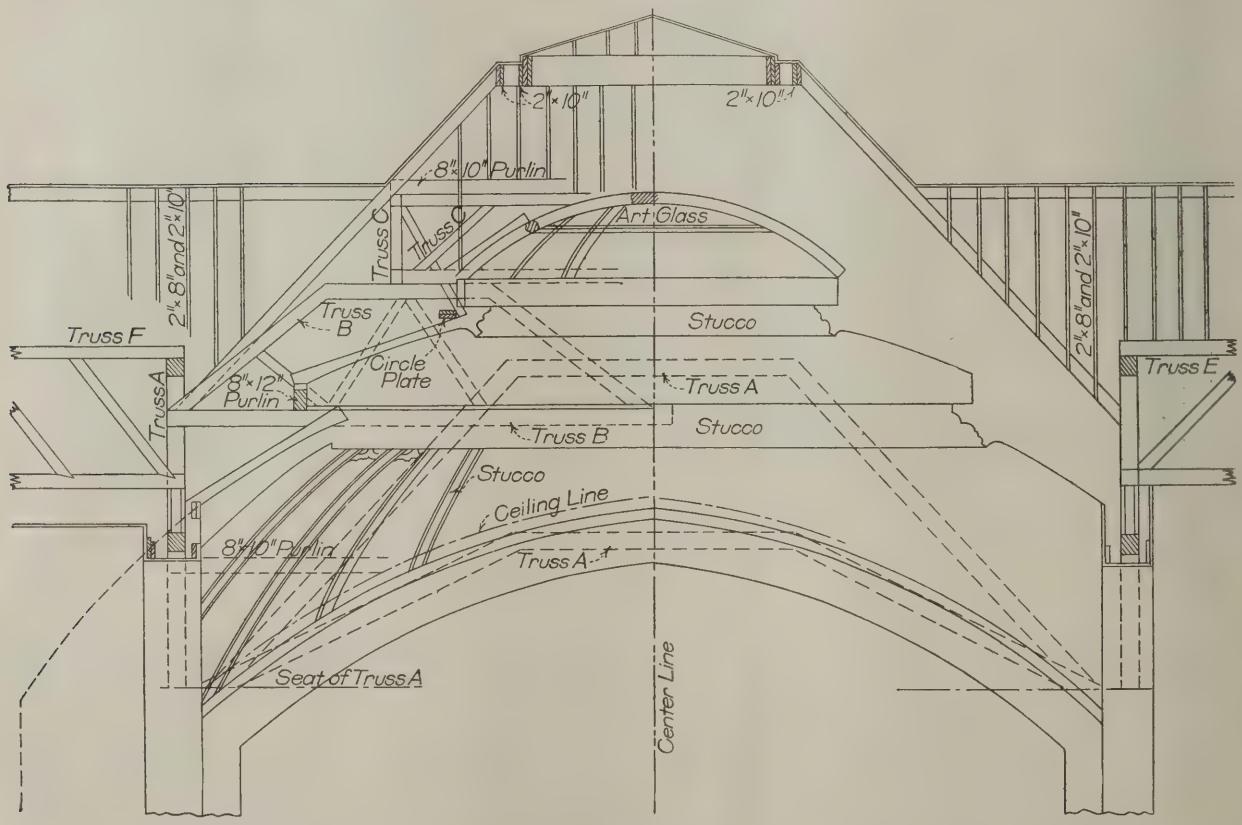


FIG. 4—CROSS SECTION THROUGH DOME, SHOWING THE COMPLICATED FRAMING

lighted, has provision for the primary and beginners' departments of the Sunday School and will accommodate 400 pupils. Here is also located the large social room with a seating capacity of 850 besides the stage, which will accommodate 100 more.

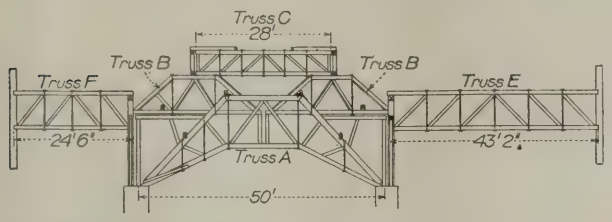


Diagram Showing Relative Position of the Various Trusses

crowding, at church socials or banquets. Here are also the church offices with fireproof vault, and the men's and women's check rooms. Taken altogether, the building presents one of the most complete and up-to-date church plants in the Northwest, and in its careful planning and artistic appearance reflect great credit on the architects.

The building is constructed of interlocking tile faced with "rug-fabric" brick, all from the kilns of the Far-West Clay Co. of Tacoma; has Tenino sandstone trimmings, art-glass windows, and the roof is covered with creosoted shingles stained moss green, from the plant of the St. Paul & Tacoma Lumber Co.

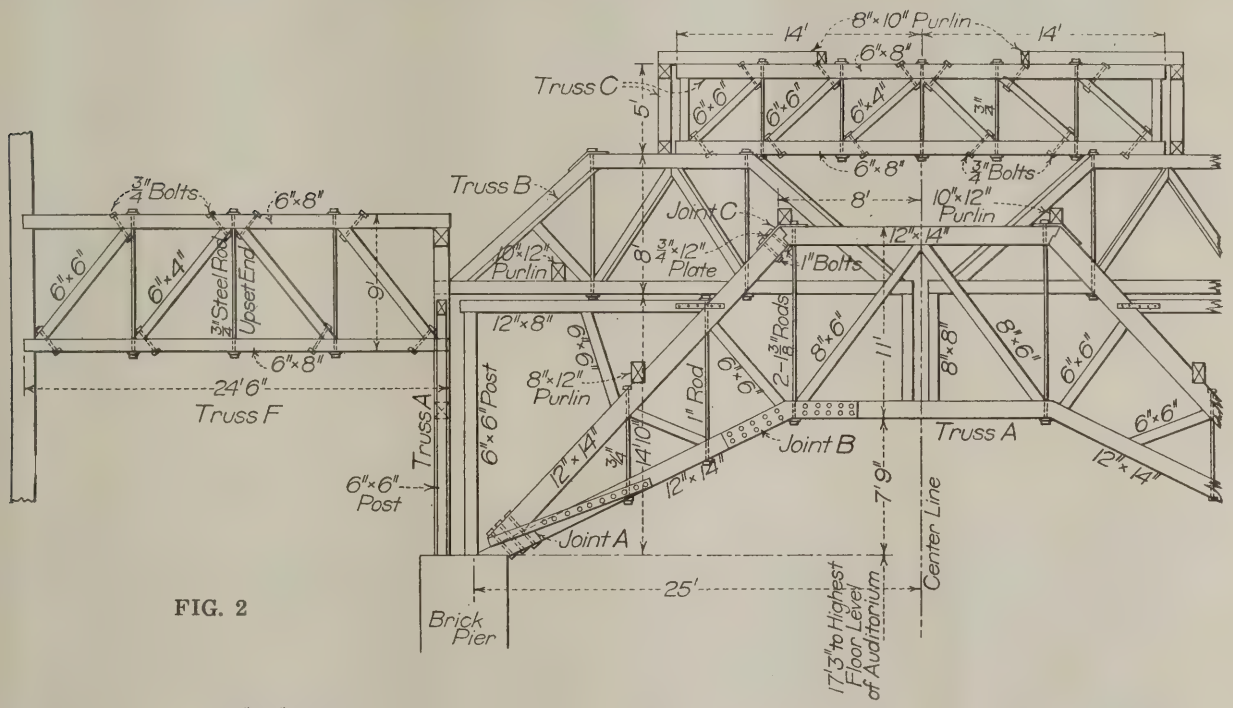
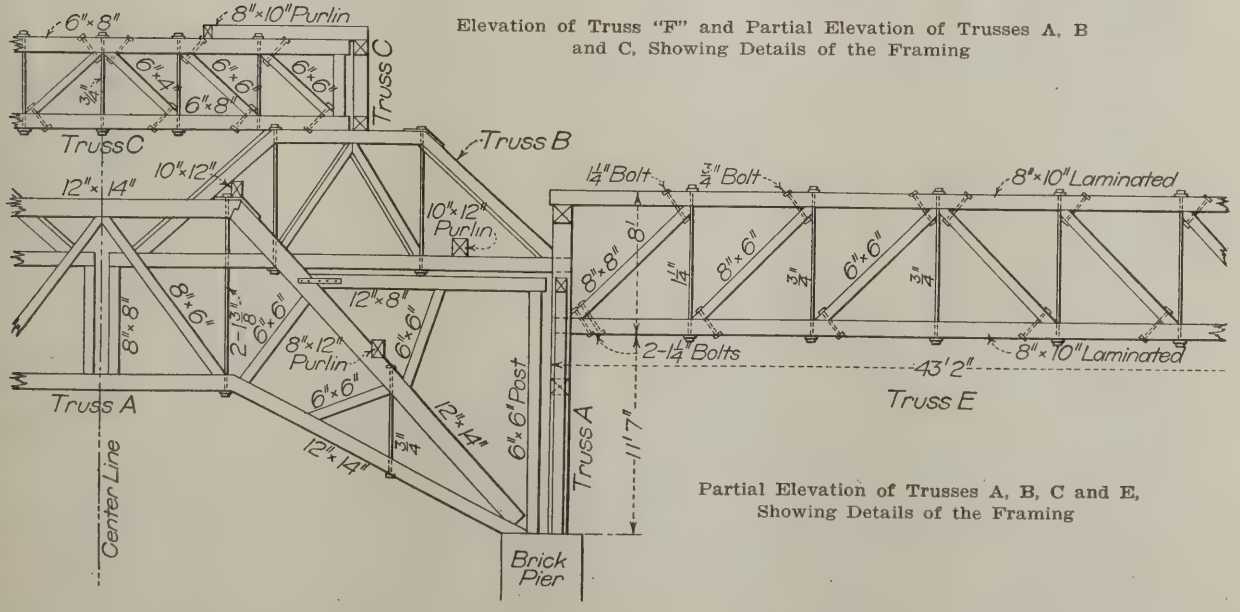


FIG. 2

Elevation of Truss "F" and Partial Elevation of Trusses A, B and C, Showing Details of the Framing



Partial Elevation of Trusses A, B, C and E, Showing Details of the Framing

Adjoining this is the kitchen—a regular hotel outfit planned to supply the needs of the 600 people for whom provision is made by sufficient "take-down" tables to permit that number being seated, without

The main auditorium is finished and seated with oak, and the Sunday-school rooms and basement in Washington fir. The details of the interior finish are similar to the ordinary finish in similar build-

ings and do not require special mention here.

The most interesting feature of the construction of the building, however, is the method of framing the dome over the auditorium and the way its weight is carried. A partial view of the dome is seen in the interior view. As will be seen by reference to the line drawing Fig. 1—the latter representing a half-plan of the trusses of the dome—the weight is carried on four massive brick piers and is entirely independent of the walls of the building. This half-plan in Fig. 1 shows the arrangement of the trusses and purlins; Fig. 2 is an elevation of the same half-plan and also an elevation of trusses *A*, *A*, *A*, *A* and *C*, *E* and *F*; Fig 3 is an elevation of trusses *B*, of which there are also four, supervision of the Church Building Committee. Sherman L. Blair, one of the trustees of the church and a builder of large experience was in personal charge of the work, and to his efficiency and experience much of the credit for securing so well built and well finished a structure for a moderate cost is due.

It may be of interest to state that there seems to be quite a general tendency in Tacoma and vicinity for churches to forestall any adverse criticism resulting from labor troubles between the contractors and their workmen on their buildings by taking direct charge of the work themselves and having it done by day's labor. It may safely be stated that nearly every church edifice of any size that has been

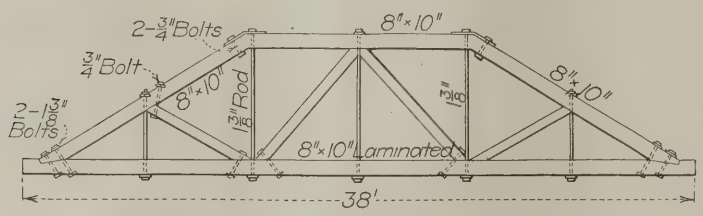


Fig. 3—Elevation of Truss "B"

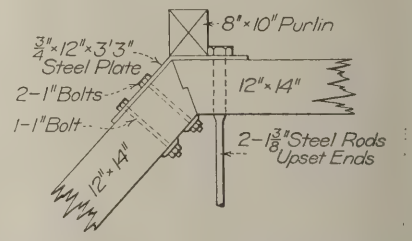


Fig. 7—Detail of Joint "C" in Truss "A" —Scale ¼ In. to the Foot

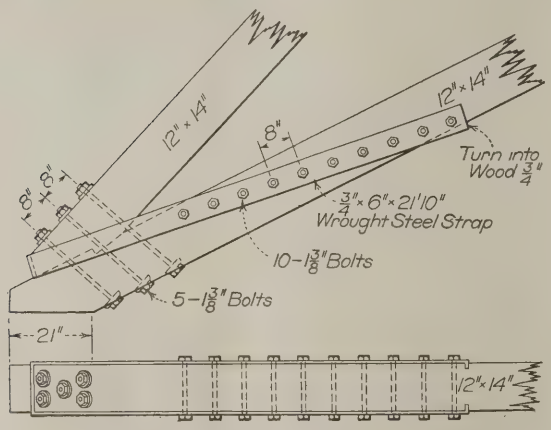


Fig. 5—Detail of Joint "A" in Truss "A"—Scale ¼ In. to the Foot

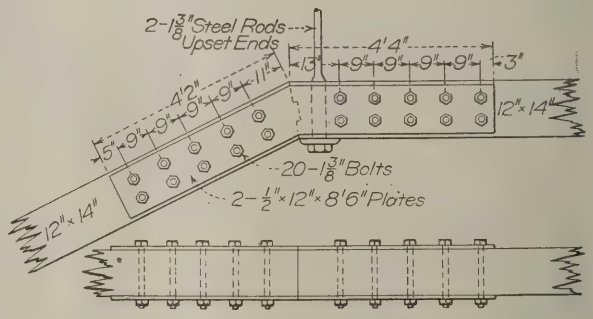


Fig. 6—Detail of Joint "B" in Truss "A"—Scale ¼ in. to the Foot

while Fig. 4 is a section through the dome showing the location of the art-glass with which it is lighted and also how that is protected by the skylight above.

The drawings and pictures are self-explanatory and show the construction more fully than could any description. The manner in which the tie-beam in trusses *A* are planned to give greater clearance for the arch below as shown in the interior view is particularly interesting. The way the joints are re-enforced to secure greater strength and resist the lateral thrust and tendency to settle is shown in the detail drawings Figs. 5, 6 and 7.

The Sunday-school auditorium is also lighted by a circular skylight, but as it is flat and supported by simple trusses it does not require separate description. Suffice to say that it is a flat circular sash supported by perpendicular walls a few feet in height and protected by a skylight above.

The work was done by day's labor under the erected in Tacoma for the last ten or fifteen years has been built in this manner.

DURABILITY OF STEEL FRAME CONSTRUCTION

What is the life of a steel frame building? When these structures were first erected, a little more than a quarter of a century ago, many predicted that the steel would rust, and within ten or fifteen years the structure would become dangerous.

But there now are standing a number of buildings more than twenty-five years old, constructed on the steel frame principle, with the weight supported by it and the walls merely a shell.

These buildings are in good condition, practically as solid and substantial as when they were built. But recently the razing of the old Champlain Building on the northwest corner of State and Madison



A VIEW OF SOME OF THE UNCOMPLETED FRAMING OF THE CHURCH DOME



INTERIOR VIEW OF THE CHURCH, SHOWING THE DOME OVER THE AUDITORIUM

Streets, Chicago, according to Straus's *Investors Magazine*, gave the opportunity to examine the condition of the frame work and allow experts to draw the deduction that a properly constructed steel frame building will last for hundreds of years.

The Champlain Building was constructed in 1893 on a lot 63 by 106 ft. The building was fifteen stories in height, with one shallow basement. It had structural steel framework, with joists five feet apart; flat tile arches and fireproofing of terra cotta brick and terra cotta curtain walls, and a so-called floating foundation—shallow spread footings on blue clay. The steel frame was painted with iron oxide paint, two coats.

When the building was torn down after standing for nearly a quarter of a century it was found that the steel was practically unaffected by rust, the greatest corrosion visible under the microscope being .009 of an inch. Practically speaking, the steel was in as sound condition as when it was first put in place, and all signs indicated that the building was good for an indefinite period. The footings, steel I-beams—unpainted—embedded in Portland cement, showed no corrosion whatever.

Holabird & Roche, the architects of the building, who conducted the examination when it was torn down, came to the following conclusions as a result of their investigation:

"The condition of this building seems to indicate that the exclusion of air and moisture is essential for the preservation of the steel and also of the paint. The appearance of the rust suggests that it may have been formed soon after the building was constructed, and that it has not been progressive. Even if the worst case of rusting has been progressive and should continue at the same rate, it would be more than a century before failure of the member would result.

"The present practice of incasing all structural steel in concrete, or plastering it with Portland cement mortar; separating the pipe shaft from the steel, and of using greater care in covering terra cotta anchors, certainly safeguards the framework of the structure for a much longer period than the probable economic life of such buildings."

PHILIPPINE HOUSES

The houses of the Philippines differ with their social condition, and with the different tribes and in different parts of the island, but they may be generally classified as those built of *nipa*, or its equivalent, and those of more durable material, such as wood, brick and stone.

All the Filipinos' houses, wherever they are and whatever the material, are raised above the ground, generally the height of the first story. The space beneath is generally utilized as a stable for ponies or for chicken houses. The more durable houses are built of stone, brick or wood, and are large and roomy with plenty of window space.

The houses classed as *nipa* are made of several kinds of material, but in the main of bamboo and *nipa* palm. The frame, which is commonly very simple, is built of bamboo poles. The walls are made of a coarse mat woven of *nipa*, while the roof is thatched with the same material, *nipa* being a palm which is found abundantly in swampy places. Sometimes the sides as well as the roof are thatched with *nipa* instead of being made with this coarse mat. When *nipa* cannot be had, cogan, a coarse grass mat, is often used. The windows are mere openings, closed by shutters of *nipa* mats or of thatch. The floors are open work, made of strips of small bamboo, tied down to the floor beams.

Probably nine-tenths of the houses in the islands are of *nipa* or some equivalent plant built upon much the same plan as above. The erection of a *nipa* house is a very simple matter, requiring only a few days' labor and costing about one hundred or two hundred dollars.

They easily catch fire, but the loss is small and they are readily rebuilt. The *nipa* house is entered not by a stairway, but from a ladder from the outside. The houses, of course, are of only one story in height.

WASTE TANBARK ROOFING

A method for using waste hemlock tanbark to partially replace expensive rag stock in the manufacture of felt roofing has been developed at the Forest Products Laboratory, and is now being used commercially by co-operating mills, according to an announcement made by the Forest Service. It is stated that in these mills from 20 to 30 per cent of the rags is being replaced by waste bark, and that the quality of the finished product is equal to that manufactured solely from rags.

The extent of the saving rendered possible by the new method is pointed out by the fact that the roofing mills of the United States have a total estimated annual production of 237,000 tons of finished roofing of all kinds, equal to about 11,300,000 "squares," a "square" of roofing being 100 square feet. The utilization of the waste bark in this industry should, it is said, enable the mills to reduce their manufacturing costs appreciably.

ARCHITECTS AND HEALTH BOARD RULES

The investigation of the hotel and restaurant kitchens which was conducted last year by the inspectors of the Health Department, Bureau of Food and Drugs of New York City, showed repeatedly that extensive structural alterations in kitchen arrangement made by the architects was necessary to promote sanitary conditions, and the remodeling expense could have been avoided had the architect who planned the kitchens and serving rooms been familiar with the Health Department's regulations. In order to obviate difficulties arising from this source the department has addressed a letter to all of the architects in the city, inclosing a copy of the rules and regulations relating to hotels and restaurants and a copy of the score card used by the department's inspectors.

UNIQUE CONCRETE BLOCK CONSTRUCTION

THE METHOD USED IN CONNECTION WITH THE ARMORY FOR THE ILLINOIS FIRST CAVALRY

A NEW method of making large concrete blocks having a very smooth and attractive surface was employed in the new Illinois First Cavalry Armory north of Chicago Avenue and near Lake Michigan in Chicago, Ill. The plans for the structure provided a head house a block long, five stories and basement in height facing the lake with a large arched drill-hall in the rear. The state appropriation obtained was very small and for this reason only the basement and three stories of the head house were built at this time. The ends of the head house are semi-circular and there is also at each end a large semi-circular stair turret placed at a 45 deg. angle with the longitudinal axis on the side adjoining the proposed drill-hall. The general dimensions, not including the stair turrets, are, length 219 ft. 7⅝ in., width 64 ft. 9 in. The desire to obtain a permanent structure of imposing appearance with the limited appropriation led to the adoption of large concrete blocks for the surface wall facings.



UNIQUE CONCRETE BLOCK CONSTRUCTION IN CONNECTION WITH THE NEW ILLINOIS FIRST CAVALRY ARMORY

The general contract was let to Hanson Brothers Company, 127 North Dearborn Street, Chicago, who designed the equipment for casting the blocks and conducted the experiments for obtaining the smooth block surface. A track was built 100 ft. long with rails 19 ft. apart, on which was constructed a wood traveler, and from the corner posts of which at one end were erected jib cranes, each operated by a hand hoist. The traveler was moved along the track by means of a cable connecting the ends of one of the rails and carried around the drum of a hand winch mounted at the side of the traveler frame. The space between the rails was floored and on this all forms for blocks were erected in convenient reach of the jib cranes. The standard width of each block course was 2 ft., but on account of the semi-circular ends of the building and many window openings the lengths of blocks varied greatly, the longest being about 8 ft. A large number of blocks were of unusual shape, many of them with faces, the arc of a circle and many special forms were therefore required.

The blocks were cast face downward. The bed

of each form was covered with galvanized sheet iron and great care taken before casting a block to have the sheet iron surface perfectly smooth and clean. The side forms were wedged into position inside of wood frames. The surface of the block, about 1 in. thick, was composed entirely of fine aggregates with a large cement content thoroughly mixed with only enough water so that the material would adhere when pressed in the hand and tamped very hard in the forms. The proportion of the aggregates used in the surface of the block was one barrel of limestone screenings to one barrel of sand and three bags of cement. The smooth texture of the surface of the block depended upon having the galvanized sheet iron bed of the form perfectly clean and without markings of any kind.

Back of the surface layer of concrete was placed a reinforcement of triangular mesh heavy wire netting and two heavy wire lifting loops were also placed in each block. The back of each block was composed of standard 1:2:4 concrete, also mixed dry but containing considerably more water than the surface layer.

The picture shows the traveler, the concrete mixer and several curved face blocks on the bed forms. The concrete was mixed in "The Standard" Low Charging Mixer, the large open charging end of which permitted the entire batch to be seen while mixing and therefore particularly adapts it to conditions where an even consistency mix is required. These blocks when built into the wall not only have a massive appearance but present a pleasing effect without acid treatment of any kind. A feature also is that this method of construction provides a structure of great durability at small cost.

"EASY-TO-MAKE" FURNITURE

The above is the title of a book in portfolio form bound in paper covers containing one hundred designs with full details of various kinds of furniture which the carpenter and cabinet-maker who is clever in the use of his tools can manufacture for his household or for clients during otherwise dull seasons. In other words, he can make a side line of this kind of work or he can take it up as a regular business according to circumstances. The designs include chairs, tables, desks, bookcases, etc., and the details are drawn to scale so as to render them readily useful to the mechanic. As the work is in portfolio form the sheets, which are 18 x 12 in. in size, can be readily removed from their binding should circumstances require. C. H. Thomas, Kennett Square, Pa., has the sales agency and the price of the work is $3.00.

Three hundred houses costing from $2,000 to $5,000 each are planned for erection in Erie, Pa., by Baldwin Bros. The majority of the houses are intended to be modern bungalows and single family frame dwellings, although a few two-family brick houses will be erected.

New Publications

The Building Estimator's Reference Book. By Frank R. Walker. 3535 pages, size 5 x 7 in. Illustrated. Bound in flexible cloth. Published by Frank R. Walker. Price, $5.00.

The estimator who computes the approximate cost of a modern building must necessarily eliminate guesswork as far as possible, and one of the best means of doing this is by an examination of the data which has been compiled by men thoroughly familiar with the subject. An excellent aid to this end is to be found in the book under review, it being the second edition of a work which has been thoroughly revised in order to take care of the radical changes in cost data that have occurred during the past year. The costs given in the work are taken from reliable sources, as in most cases the author was on the work during construction and compiled all cost data during the progress of it. In other cases it was obtained from the actual cost sheets coming in from the job each week, and compiled at the completion of the work. Numerous illustrations, which include reproductions of photographs and line drawings, are given. The half-tone engravings were reproduced from photographs taken during the progress of the construction so as to show actual conditions existing on the job, thus illustrating the methods and plant employed, from which the labor cost on the branches of work resulted.

The book covers the subject very thoroughly, the matters treated including estimating upon overhead expense, excavating, concrete for footings and foundations, water and damp proofing, reinforced concrete construction, brick masonry, rubble stone work, cut stone, granite, architectural terra cotta, hollow tile fireproofing, carpentry, mill work, lathing, plastering, various branches of sheet metal work, painting and varnishing, hardware, plumbing, heating, electric wiring, sprinkler systems, etc.

How to Run an Automobile. By Victor W. Pagé, M.S.A.E. 178 pages, size 5¼ x 7½ in. Illustrated. Bound in cloth. Published by the Norman W. Henley Publishing Company. Price, $1.00.

This is a book intended for the man with his first car, and deals with the operating principles of modern gasoline automobiles. It is intended to be a non-technical compilation of the operating instructions of leading automobile manufacturers with which the car owner should be familiar. The text and illustrations are of such a nature that the man unfamiliar with the subject can easily grasp the principles presented.

A wood specimen found in glacial drift and estimated by the Wisconsin State geologist to be approximately half a million years old has been identified by the Forest Products Laboratory of the Forest Service as spruce.

BUILDING STUCCO WALLS FOR HOUSES

SOME VALUABLE INFORMATION FOR THE PRACTICAL BUILDER DOING STUCCO WORK

IT is a well recognized fact that a properly designed and constructed stucco coated house embodies features that add in many ways to the comfort of its tenants while presenting an exterior that is pleasing in appearance and improves with age. The growing popularity of this type of building is no doubt due in a measure to the fact that stucco is adaptable to every style of structure, can be varied in many ways as to finish and color and requires little if any painting and no repairs.

Obviously substantial walls are an important feature as they must not only render good service as regards carrying capacity and resistance to the weather but they should also be fire retarding and finished in a way to add to the attractiveness of the rooms in the building. Usually two methods are followed in building stucco walls for dwelling houses. One is known as the back-plastered type and the other as the sheathed type. The back-plastered type gives the best results, but is a trifle more expensive. These methods are so interestingly described in "Modern Walls and Ceilings for Residence Construction" recently published by the North Western Expanded Metal Company and the information is of such practical value to the builder that we give it herewith.

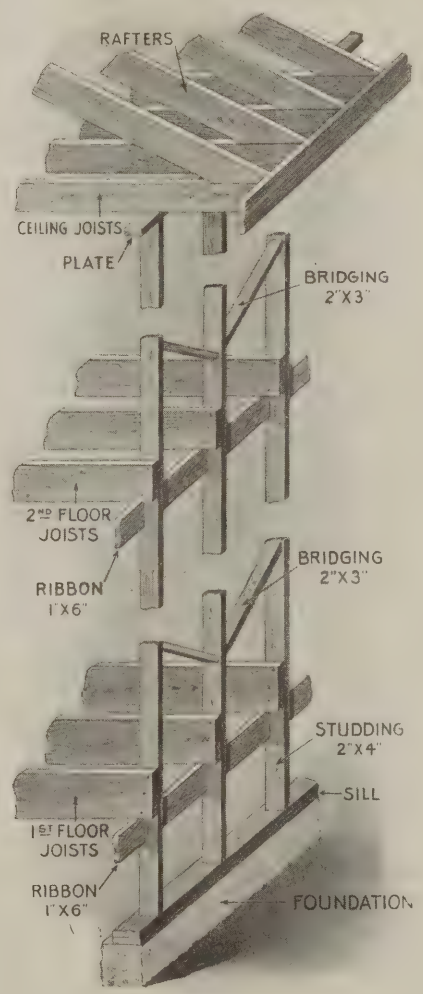
BACK PLASTERED TYPE OF WALL

In the back-plastered type, the frame is erected in the usual manner as shown in the accompanying illustration. The studding for the walls are braced with one line of bridging between the floors. The exterior faces of the studs are coated with a waterproof paint or covered with waterproofed building paper. This waterproofing extends back to the center of the studs and is necessary to prevent the stucco from coming into contact with the wood and to prevent rotting of the studding. Expanded metal lath is fastened directly to the outside of the studding without using any sheathing, small metal furring strips or pencil rods being attached to the face of the studs.

Sometimes a wood lath is used for a furring strip, but this should never be permitted if first class results are desired. The purpose of furring is to bring the lath out a sufficient distance from the studding so that the plaster can flow through the lath and clinch to it. The wide surface of a wood lath defeats this purpose and in addition to that, will cause cracks in the stucco and in time will rot out, leaving the lath fully exposed.

After the lath is in place, three coats of stucco are applied to the exterior. Before the lath for the inside of the walls is put on, a fourth coat of Portland cement plaster is applied to the inside of the exterior lath, filling in between the studding to a depth of ½ to ¾ of an inch. This completely covers the lath so that it is practically in the center of the stucco, making a reinforced concrete slab of the entire wall covering 1½ to 2 in. thick.

When the sheathed type of stucco wall is to be built, the usual method for constructing wood frame buildings is followed up to the placing the sheathing. After the sheathing has been nailed diagonally to the studding, waterproofed building paper is nailed over the sheathing. Self furring expanded metal lath is then placed over the paper and nailed or stapled to the sheathing.



VIEW SHOWING FRAMING FOR A BACK-PLASTERED STUCCO WALL

After the metal lath is in place, the stucco is applied in three coats, the first coat being forced through the lath and against the building paper so

as to imbed the face of the lath ½ in. or the depth of the furring ribs.

There are a number of different finishes used for the last coat of stucco any of which will give satisfactory results, the selection being largely a matter of personal choice.

In selecting the materials for the exterior walls of a home permanence and attractiveness should outweigh the question of first cost. A material that is cheap will result in walls of unsatisfactory appearance and a cost for repairs that will in a short time more than offset the slight additional first cost of a high grade metal lath. The advantages are the elimination of cracks, the making of the walls fire resisting, permanence and the reduction in cost for upkeep.

COMMON SALT FOR PRESERVING WOOD

Many methods are in use for preserving wood and preventing the attacks of rot. Most of these, such as the chloride of zinc and the sulphate of copper treatment, are comparatively expensive, and are applicable therefore only to the better classes of wood; moreover, they can only be used by the large industrial works, and are not suitable for private use. It has now been discovered, according to the Scandinavian report reproduced by the *Timber Trades Journal,* that ordinary common salt is an excellent substance for impregnating wood and for preserving it against decay. The effects of the action of common salt on wood were first noticed at the Great Salt Lake in Utah. It was observed that the sleepers of a railway line which was continuously washed by the very salt waters of the lake needed no renewal, and after forty-three years were in a far better state of preservation than oak sleepers impregnated with expensive chloride of zinc after fourteen years, when these latter required renewal. In consequence of this discovery, comprehensive experiments have been made of the effect of salt impregnation of wood, and entire success is reported.

A PLEA TO "BUILD NOW"

Building operations throughout the country continue with but little abatement, the first quarter of this year showing a loss of only a fraction of 1 per cent as compared to 1916, while 1916 displayed a great gain over 1915. Hoggson Brothers, the New York and Chicago builders, announce that they started active operations in April on five buildings for banks alone in different sections. Authorities for the most part seem agreed that the chances for building material prices to take a drop are quite remote, whether hostilities continue for some time or whether peace should come within the near future. It is argued that the after-war demand on our industrial resources will be infinitely greater than they have been. France has just recently closed a contract involving 200,000,000 francs, most of which sum is to be spent in America for building materials to be used in the reconstruction of important buildings in cities in the vicinity of Verdun, the Argonne and the heights of the Meuse.

The danger of a cessation of building activities does not lie so much in the impression that prices are too high as it does in an attempt to carry the economy idea to harmful lengths. Nothing could be more injurious than indiscriminate delaying of plans for building. This would create an industrial situation that would be far-reaching in its evil effects.

Two years ago the prospective builder was urged to "Build Now" to secure the advantage of low prices and to give employment to idle labor. To-day he is urged to "Build Now" so as to keep skilled labor employed, to keep the wheels of industrial activity going, and to take advantage of present prices, lest he be forced to pay even more if he delays.

CHANGES IN STAIR BUILDING

Stair building to-day is quite different in some respects to what it was even twenty or thirty years ago, says a writer in the *Building Journal.* Then we had with us the old fashioned stairbuilder, with his kit of wonderful tools for laying out, fitting and erecting the beautifully curved rails and strings, with their neatly turned balustrades and newels.

His work was largely handwork, as it was difficult to prepare work of this kind in the shop, and, besides, the stairs were then fitted to the building, and any little variation was taken care of by the stairbuilder.

The change in the nature of stairs is a little more pronounced than in some other items of trim and mill work. But the stairbuilder's work has always been in a state of transition.

Until a few hundred years ago there was little attempt to feature the stairs as an important part of the building. Any way to get up to the upper floors was good enough, it seemed, and so there are many old houses and castles to-day in which the stairs are narrow and enclosed in heavy masonry walls, without any attempt to decorate or embellish them.

AN ODD CONCRETE HOUSE

A summer house of concrete in a garden in one of the suburbs of Havana is built in imitation of a log and straw hut, and it is said that the illusion remains even after a close examination. To make the illusion more complete, in parts of the fictitious timber trunks the artist has imitated the work of the teredo worms, and some of the pillars appear to be bored by them.

The Bethlehem Steel Company has awarded contracts for the building of one hundred homes at Petersburg, Cape May County, N. J., in which to house the families of the men it is to employ in a two-story plant to be built there.

CONSTRUCTION OF A LOW COST ICE BOX

SOME PRACTICAL DETAILS WHICH THE CARPENTER WILL FIND USEFUL IN DOING THE WORK

SEVERAL correspondents have requested details as to the construction of an inexpensive refrigerator, and with a view to affording some suggestions in regard to the matter we present a plan and elevation, together with longitudinal and cross sections of an ice box of the character indicated. The drawings and details are found in Farm Bulletin No. 6, issued by the Trade Extension Department of the National Lumber Manufacturers' Association, Chicago, Ill.

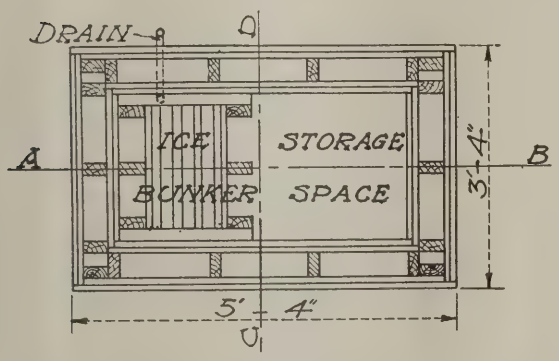


Fig. 1—Plan View Showing Arrangement of Parts

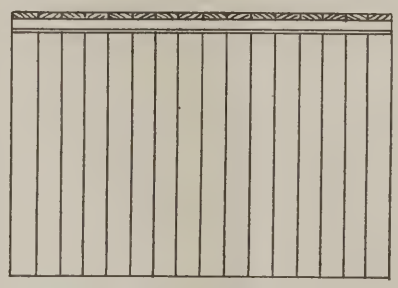


Fig. 2—An Elevation

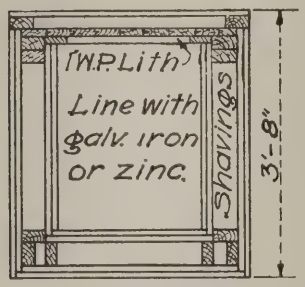


Fig. 3—Section on Line C-D of the Plan

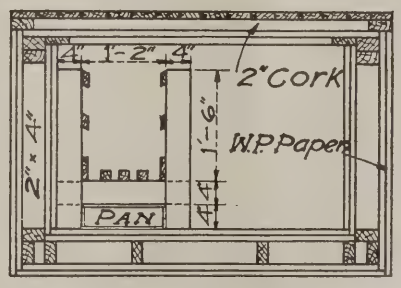


Fig. 4—Section on Line A-B of the Plan

The frame of the box is constructed of 2 x 4-in. stuff, on each side of which are two layers of matched lumber, waterproof paper being placed between the layers so as to make as tight and dry a joint as possible. The spaces left vacant between the studs and between the two layers of matched lumber may be filled with any material that is a good non-conductor of heat and cold. The placing of the corner studs should be noted. The construction for the bottom is similar to that of the sides.

The cover or top consists of a frame made of 2 x 4-in. stuff, and on each side of the frame is a layer of waterproof paper and a layer of matched lumber. Under the lower layer is nailed a frame of 2 x 4-in. material, and in the space bounded by the frame is fastened a 1-in. thick sheet of waterproof insulating material, such as cork, for example. The entire lower surface of the cover and the inside of the box should be covered with galvanized iron or zinc. As the cover is quite heavy, it should be provided with a counterweight. Three heavy 5-in. hinges are necessary and a good clamp to seal the cover is advisable.

The ice bunker is made of 2 x 4-in. stuff with 2 x 2-in. cleats at the bottom for the ice to rest on, and at the sides of the bunker are provided 1 x 2-in. cleats beveled so that the water will drain off them easily, as shown in the cross section.

A galvanized iron pan is placed below the ice bunker to catch the water from the melting ice. This pan connects with the outer air by means of a drain pipe with an "L" at its outer end, the opening being placed upward so that the drain will have a seal of water between the pan and the outer air, thus preventing warm air from working in through the drain.

The New Era Homes Corporation of Brooklyn, N. Y., has acquired 140 lots on Avenue O, East Fifth and East Fourth Streets, in that city, and plans to erect on the property about thirty modern dwellings of a unique style of architecture, each dwelling having 40 to 60 ft. frontage and a garage.

BRIEF REVIEW OF THE BUILDING SITUATION

BUILDING OPERATIONS FOR APRIL SHOW 6.07 PER CENT DECREASE FROM APRIL, 1916

IN view of the continued high prices and generally unsettled conditions prevailing in the building trades, as well as in other industries, it is not surprising to find a decrease of 6.07 per cent in the estimated cost of new construction work for the month of April, as compared with the corresponding month of 1916. Out of a total of 124 cities reporting, 74 show a loss as against 50 reporting a gain in building activity. The Eastern portion of the country reflects a loss of 14.43 per cent for April, as compared with April a year ago, the loss here being greater than in any other section. Out of 48 cities reporting, 29 show a falling off in building as against 19 which report a gain.

An idea of the situation in the Eastern cities may be gained from the following figures:

CITIES IN EASTERN STATES

	April, 1917	April, 1916
Albany	$351,540	$432,455
Allentown	395,760	370,720
Altoona	24,897	140,933
Atlantic City	1,204,213	210,535
Bayonne	83,900	66,465
Binghamton	274,876	193,850
Boston and vicinity	8,030,000	6,837,000
Bridgeport	545,075	646,437
Brockton	53,382	100,110
Buffalo	939,000	803,000
East Orange	210,226	215,143
Elizabeth	189,980	63,245
Erie	689,099	282,429
Harrisburg	190,940	373,445
Hartford	1,197,727	1,091,511
Hoboken	13,234	63,860
Holyoke	20,140	186,860
Irvington	47,135	70,397
Lawrence	55,200	263,320
Manchester	547,530	124,027
Newark	1,164,433	842,617
New Bedford	117,500	779,665
New Britain	123,470	158,155
New Haven	543,154	409,630
New York:		
Manhattan	3,685,415	8,599,760
Bronx	1,648,606	1,923,473
Brooklyn	2,452,557	3,952,243
Queens	2,185,666	2,394,637
Richmond	342,314	370,971
Niagara Falls	268,295	378,755
Passaic	54,200	111,675
Paterson	167,027	251,169
Philadelphia	5,009,740	6,227,780
Pittsburgh	1,094,109	1,250,762
Portland	74,005	162,775
Quincy	109,620	223,269
Reading	226,200	255,150
Rochester	564,377	1,168,294
Salem	142,800	487,152
Schenectady	301,570	213,562
Scranton	147,306	110,875
Springfield	739,659	465,785
Syracuse	851,055	681,270
Trenton	126,923	327,623
Troy	32,133	54,896
Utica	180,460	153,340
Wilkes-Barre	195,773	69,905
Worcester	1,009,004	573,423

The middle section of the country reports a loss of only 2.03 per cent, with 23 cities out of a total of 37 contributing to this result. Chicago, Cincinnati, Cleveland, Duluth, Grand Rapids, Lincoln and Minneapolis show a loss, while Akron, Des Moines, Detroit, Milwaukee, St. Louis, Sioux City and South Bend report a gain.

CITIES IN MIDDLE STATES

	April, 1917	April, 1916
Akron	$2,431,213	$1,340,829
Canton	554,845	453,755
Cedar Rapids	179,000	205,000
Chicago	9,524,450	11,371,600
Cincinnati	1,039,780	1,156,165

CITIES IN MIDDLE STATES (Continued)

	April, 1917	April, 1916
Cleveland	2,441,500	2,625,055
Columbus	532,000	1,166,840
Davenport	189,620	92,230
Dayton	215,204	259,370
Des Moines	273,330	162,075
Detroit	5,284,705	3,813,370
Dubuque	40,805	103,500
Duluth	101,992	612,348
East St. Louis	81,925	92,835
Fort Wayne	184,785	349,236
Grand Rapids	184,987	488,097
Great Falls	194,580	102,250
Indianapolis	775,802	861,674
Kansas City, Kans	92,400	105,846
Kansas City, Mo	1,291,400	1,219,949
Lincoln	107,040	426,260
Milwaukee	2,025,070	876,958
Minneapolis	1,284,685	3,043,085
Omaha	460,350	406,835
Peoria	231,919	103,769
Saginaw	38,067	39,705
St. Joseph	110,015	260,519
St. Louis	1,707,991	1,003,146
St. Paul	877,244	966,504
Sioux City	478,770	214,250
South Bend	400,438	82,038
Superior	106,052	131,181
Terre Haute	41,063	55,667
Toledo	1,176,969	1,188,467
Topeka	11,665	62,967
Wichita, Kan.	447,510	387,510
Youngstown	349,675	373,001

The Southern zone shows a loss second only to that of the Eastern section, for out of 20 cities reporting 12 show decreased activity and 8 a gain, the percentage of decrease being 13.15 per cent.

CITIES IN SOUTHERN STATES

	April, 1917	April, 1916
Atlanta	$441,413	$573,647
Baltimore	853,819	763,275
Birmingham	175,539	171,509
Charlotte	60,475	141,880
Chattanooga	55,005	91,300
Dallas	190,730	194,201
Fort Worth	247,065	211,298
Huntington	161,480	163,225
Jacksonville	15,765	58,485
Louisville	261,820	298,690
Memphis	201,105	282,545
Montgomery	14,590	46,100
New Orleans	175,683	242,061
Norfolk, Va.	299,741	226,384
Oklahoma City	313,034	193,085
Richmond	359,015	595,608
San Antonio	190,527	124,928
Savannah	136,300	102,875
Washington	714,305	1,192,098
Wilmington	266,278	237,878

The West is the only section of the country reporting a gain for April, the percentage of increase being 4.2 per cent. Out of 19 cities reporting 9 show a gain as against 10 a loss.

CITIES IN EXTREME WESTERN STATES

	April, 1917	April, 1916
Berkeley, Cal.	$84,000	$143,780
Colorado Springs	16,790	28,373
Denver	809,250	340,960
Fresno	195,900	110,427
Los Angeles	2,700,600	1,304,407
North Yakima	101,585	28,613
Oakland	388,998	706,479
Pasadena	256,914	189,813
Portland	390,880	457,765
Pueblo	19,240	23,671
Sacramento	213,171	79,573
Salt Lake City	228,015	260,745
San Diego	66,974	208,454
San Francisco	906,846	2,247,187
San Jose	32,705	86,251
Seattle	670,905	556,510
Spokane	89,655	62,434
Stockton	121,886	77,780
Tacoma	102,553	185,110

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

New End Discharge Concrete Mixers

Building contractors and others having occasion to do more or less concrete work cannot fail to be interested in the two new sizes of end discharge mixers which have just been added to their already extensive line by the Northwestern Steel & Iron Works, Eau Claire, Wis. These mixers are of 5-ft. and 10-ft. capacity and are adapted to varied uses. The construction is such that

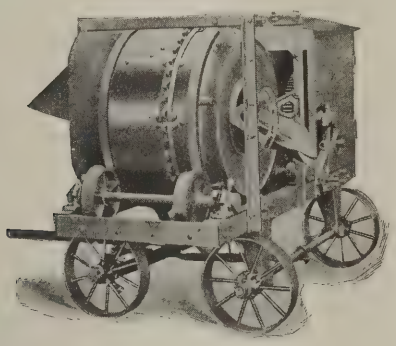


Fig. 1—New End Discharge Concrete Mixer

each, it is claimed, will turn practically within its own length. The new mixers are of the popular non-slop "Northwestern" type, remodeled so as to give end discharge and easy maneuvering in specially close quarters. At the same time the company is calling attention to the increasing use of its mixers for handling mortar claiming that one man with a "Northwestern" machine can mix enough mortar for twelve bricklayers. When mixing mortar with the machine it is necessary to slake the lime twenty-four hours in advance, the most general practice being to use two boxes for this purpose—slaking and emptying alternatively. A view of the mixer is shown in Fig. 1.

Beautiful Woodwork

"Beautiful Woodwork" is the title of a handsome *brochure* illustrated by reproductions in colors of living rooms, dining rooms, bedrooms, kitchens, etc., the idea being to show how versatile and attractive North Carolina Pine is when used as interior trim. Each illustration is accompanied by a short paragraph pointing out valuable ideas in connection with interior decoration and design. Colored plates showing the beauty of the wood are also contained. A copy of the work may be procured by addressing the North Carolina Pine Association, 71 Bank of Commerce Building, Norfolk, Va.

Why Beaver Board Advanced in Price

The Beaver Board Companies, 111 Beaver Road, Buffalo, N. Y., are sending out a folder describing the present conditions as the company finds them, and treating particularly on the matter of price increases. The present advance in the price of Beaver board is the fourth during the past twelve months, and these we understand have been the only advances made in three years, the aggregate advance being, it is said, about 25 per cent. The folder first tells of what Beaver board is made, the statement being presented that three-quarters of its weight is spruce fibre and the other quarter made up of fireproof adhesive, the chemicals employed in treating the fibre and the materials used in moisture-proofing and sizing it. The folder considers the increase in the cost of wood, the value of wood fibre and other features likely to interest the practical builder and prospective house owner. Those readers who desire a copy of the folder can obtain it on application to the company.

The Iowa Ventilating Windows

One of the important structures which go to make up the group of modern buildings usually found on the up-to-date farm is that of the piggery and the amount of attention which is given to its lighting and ventilation is in keeping with the success which it is desired to accomplish. One of the generally recognized facts in connection with the hog house is that it should be built in such a way as to let in plenty of sunshine and to accomplish this an improved form of window has been brought out by the Whitnell Manufacturing Company, of which Charles O. Whitnell is the manager, Kingsley, Iowa. One form of this window is intended for use on the roof as shown in Fig. 2 and the other is intended for the side as in Fig. 3, which represents an exterior view. These windows are intended solely for ventilating purposes and the opening and closing of what is known as the Iowa King is accomplished by means of a light rod and lever. This can be arranged from the center feeding alley of the piggery and when the window is opened the lever locks it firmly against even the strongest wind. The point is made that it is both rain and wind proof. The company recommends that the window shown in Fig. 2 should be used in combination with the regular Iowa window, and the sash swinging out breaks the wind so that the air

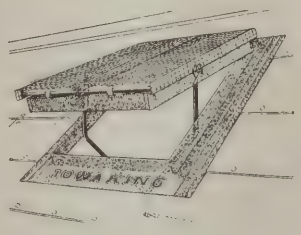


Fig. 2—Window for Use on Roof

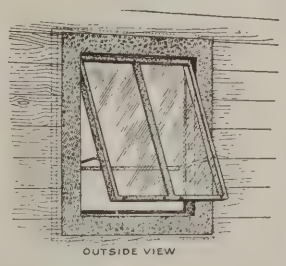


Fig. 3—Exterior View of Side Window

passes in gently. The window shown in Fig. 3, which is more especially designated as the "Iowa Queen," is practically a new construction arranged for use on side walls. It is strongly built of galvanized steel and hinges at the top of a sash so that the window may be swung outward and opened for ventilating purposes. The "V"-shaped channel runs around the inside of the

frame and engages the "V"-shaped under side of the sash. The full size of the window is 30½ x 38½ in., which includes flashing.

Calculator for Designing Concrete Slabs

A handy calculator for designing reinforced concrete slabs, beams and girders, also for various kinds of wood, has been brought out by Kolesch & Co., 138 Fulton Street, New York City.

The Jennings Arrow Head Expansive Bit

Progressive carpenters the country over are likely to be interested in several important features connected with the Arrow Head Expansive Bit which has been

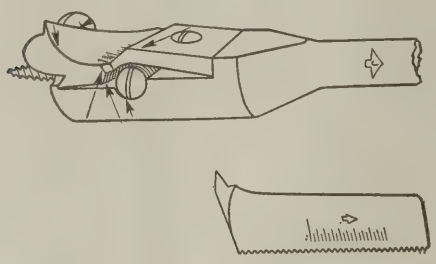


Fig. 4—Various Details of the Jennings Expansive Bit

introduced to the trade by C. E. Jennings & Company, 71 to 73 Murray Street, New York City, and an illustration of which is presented in Fig. 4. An examination of the diagram will show that the cutter can neither slip nor creep, this being prevented by the engagement of the threads on the cutter with the micrometer screw adjustment combined with the pressure of the heavy cap upon the beveled surface of the cutter for the entire width of the cap. In this connection the company suggests that all users of Expansive Bits be sure to tighten the cap screw after setting the cutter and before beginning to bore with the bit. The heavy cap is of such a nature that it may be adjusted to a thousandth part of an inch. Another point to which the company directs attention is the curve of the cutter which rolls up the chip and prevents hogging in. Again, the extra bevel or pitch on the spurs of the cutter is said to strengthen the spur and make it bore much easier than if it had only a straight pitch. The bit here shown is said to be of the strongest construction throughout, thus rendering it an ideal bit for machine use while saving the price of many sizes of machine bits which are expensive when it comes to the larger sizes. For this purpose it is furnished with the regular clean cut screw point or with a diamond point if so desired. The capacity of the small sized bit or No. 2, as it is called, has been increased to 2 in. instead of 1¾ in. and cuts from ⅝ in. up to 2 in. The No. 1 or large size, cuts from ⅞ in. up to 3 in., or by putting in an extra cutter the range may be extended to 4 in. Each bit is packed in a waterproof canvas case with pocket for extra cutter to prevent it getting lost.

Goodell-Pratt's New Tool Book

There has just been issued from the press a very attractive publication of 432 pages illustrating and describing the extensive line of tools made by the Goodell-Pratt Company, Greenfield, Mass. It is known as "Tool Book No. 13" and cancels all previous editions. It is of a size convenient for ready reference as well as to carry in the pocket, is bound in paper covers, and is profusely illustrated with the various tools which the company makes. Not only are old patterns shown, but there are a number of additions in the shape of tools which have been recently placed upon the market. Among these mention may be made of an aluminum level, bench vises, breast drills, chisel and punch set, cutting off tool, hand drills, high-speed bench grinder, high-speed hand drills, mitre boxes, ratchet bit braces, universal caliper, adjustable wrenches, bell centering punches, single end wrenches, speed indicator, motor sets, etc. Each tool is briefly described, attention being called to the salient features and in connection therewith a price is named. It is interesting to state that the list prices appearing in the catalog are arranged in accordance with the company's Simplified Price System and are to be regarded as correct until revised by change sheets. The building mechanic will find in this catalog a vast fund of information regarding up-to-date tools in which he is interested, and the book will serve as a valuable adjunct to his tool box. The company states that it can furnish repairs for any tool of its manufacture if customers will make it plain just what new parts are wanted. Where the owner of the tool is sufficiently mechanical to enable him to make repairs himself after receiving the new parts, it is quite practical and profitable for him to do it, but it seldom pays to return by express or otherwise tools of small value as the transportation charges and the cost of repairs are oftentimes more than the cost of a new tool.

One Method of Preparing Mortar

Every mason builder has his own particular method of preparing the mortar he is to use even though he follows in a general way the prevailing custom. It is results he is seeking—results which spell economy in the preparation of his materials. One of the most striking schemes for getting mortar ready for use and one which doubtless may be something of a novelty in many sections of the country is that which has been worked out by Mr. Adams, general superintendent for the Byers Construction Company, Kalamazoo, Mich. The scheme is of such general interest that we give the main features herewith.

A pit is first prepared that will take care of a carload of lime. In the one shown in Fig. 5, which is on the Byer's work at East Lansing, the pit is 30 ft. long, 18 ft. wide and 4 ft. deep. Into this pit was dumped



Fig. 5—Outfit for Preparing Mortar

235 barrels of lime and sufficient water added to slack it. About 4 in. of sand is then put on top of the mortar and every night this is wet down thoroughly to keep the lime at the proper temperature. The mortar is kept cool in this way and goes further than when it is slacked just before using. The Lansing mortar mixer is used for mixing the mortar and this is set as conveniently close to the pit as possible. On the other

(*Continued on page 22 of the Advertising Section*)

Our New Color Stucco —an opportunity for you

There is a new development in home building, full of possibilities for you—stucco toned with exposed colored aggregates—a stucco, at last, with tints that are warm, mellow, permanent and variegated instead of monotones.

This new stucco doesn't cost much to build—the aggregates are mostly quarry waste, and only two cubic yards are needed for the finish coat of the average house. It is easier to mix and apply than any other kind of color stucco.

Atlas-White Portland Cement

has made this new color stucco possible. Being non-staining, it shows the true color values of the aggregates. It was used in the series of experiments we have just completed to show the possibilities of aggregate-toned stucco.

We have prepared a booklet describing the new stucco and illustrating some of the sample panels in full scale and colors. It also includes a list of aggregates and a convenient guide to color stucco specifications. Send the coupon for a copy.

The Atlas Portland Cement Company

Members of the Portland Cement Association

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Des Moines Dayton Savannah

Atlas-White Stucco Home
Forest Hills Gardens, New York



ATLAS WHITE

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Send me information and specifications on the new color stucco—also the Contractor's Atlas and special information on the subjects checked:

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Good Varnish is cheapest

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covers so much more surface than ordinary varnish that it costs you less. Without any extra expense to yourself or to him, you can give your customer floors that are beautiful, sanitary and easy to care for—floors that stay looking like new month after month.

We are telling the public, in the leading magazines and weeklies, that it takes good floor varnish to do justice to floors, to protect them and keep them at their best. You'll find your customers ready and willing to pay for a good varnish job.

May we send you prices of our house finishing products?

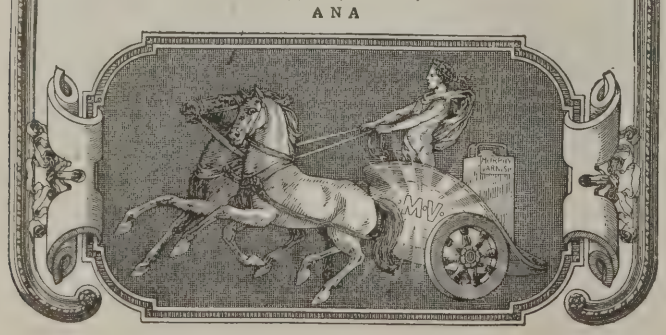
Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A



(*Continued from page 342 of the Editorial Section*)

side of the mixer is the sand pile. One man with the mixer will mix enough mortar to supply any number of masons up to 30. He also screens the sand and adds the cement to it before it is shoveled into the machine. He first puts in so many shovels full of the mortar and then adds the sand to which the cement has already been added. In a very few minutes the batch is mixed to the finest possible consistency, and it is then discharged into the large box under the end of the mixer trough. He then proceeds with another batch. The cost of operating the mixer is very low, as about the only expense is the gasoline and oil that the engine consumes. The mixer shown in the picture has seen eight years of service, but it is still clicking along and nobody seems to believe that it has yet reached the end of its usefulness. This mortar mixer is made by the Lansing-Company, 21 Cedar Street, Lansing, Mich.

New Stanley Screen Door Set No. 1754

It will not be long before the season for screen doors is in full swing and many of our readers are therefore likely to be interested in the new screen door set No. 1754, shown in Fig. 6 and which is being

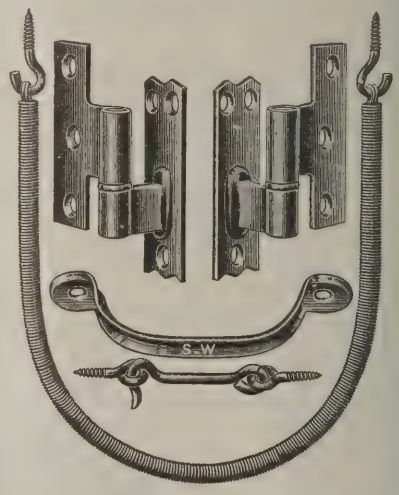


Fig. 6—New Stanley Screen Door Set

placed on the market by The Stanley Works, New Britain, Conn. This complete set of hardware is for use on screen doors hung outside of the casing or on doors that are wider than the entrance for which it is intended. The point is made that with these ⅞-in. offset hinges any screen door can be used as satisfactorily as though it accurately fitted into the frame. The set consists of one pair of offset hinges, one spring, one handle or pull, one 2½-in. gate hook and eye and all necessary hooks and screws. The set is made of wrought steel, japanned, and is packed with flat-head screws, one set in a strong, neat box.

Smith-Chicago Mixer

The recent publication of the T. L. Smith Company, 3120-B Hadley Street, Milwaukee, Wis., is known as Catalog No. 402, and entitled "Smith-Chicago Mixer," contains illustrations and descriptions of various styles of this machine. The table of capacities given in connection with the mixers is based upon the new rating adopted by the National Association of Mixer Manufacturers, the machines being rated on their capacity in wet mixed concrete. In connection with the various machines illustrated, it is interesting to note that the Smith Mixerette now has a capacity of 4 cu. ft. of mixed concrete instead of 3 cu. ft. as before, and that

(*Continued on page 24*)



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NEPONSET
PRODUCTS

This illustration *shows* why Neponset Twin Shingles are called "the roofing development of the twentieth century." First, there is a heavy sheet of tough, fibrous felt (made in our own mills). Second, this felt is thoroughly soaked with everlasting asphalt. Third, a layer of crushed stone is deeply imbedded in this sheet under enormous pressure. Fourth, another layer of Neponset Compound is applied over the crushed stone. Fifth, a layer of crushed slate gives the Neponset Twin Shingle its attractive surface of red or green.

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TWIN
SHINGLES

(Patent applied for)

are the most sturdily constructed shingles of their kind on the market today. Contractors and home owners by the thousands *know* this. They are willing to pay a slightly higher price for Neponset Twin Shingles because they know that the extra wear due to the two extra processes more than offsets additional cost. If you are interested in learning the profit-making possibilities of Neponset Twin Shingles, write for full information and price list.

BIRD & SON (*Established 1795*) DEPT. B, EAST WALPOLE, MASS.

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the horsepower of the engine has been raised from 2 horse Novo to 3 horse Novo. The new high-drum Smith-Chicago paver is also described.

"Syracuse" Nail Sets

Every carpenter includes among his "kit" of tools one or more nail sets, and he is therefore likely to be interested in a little catalog relating to these and other goods which has just been sent out by the Syracuse Twist Drill Company of Syracuse, N. Y. It is known as Price List No. 116, is profusely illustrated and presents in connection with each tool a brief description of it, together with sizes, dimensions, prices, etc. Special attention is called to the "Syracuse" nail sets, one style of which has a round body and another has a square body. The bodies are knurled and the claim is made that the sets will not slide from the fingers: the points are cupped to prevent slipping from the nail head. In the case of the square body nail sets the design is the result of careful study in order to make a well-balanced and serviceable tool. The knurling is full and clear, so as to give a firm grip, and the corners are slightly rounded to prevent injury to the fingers. These nail sets are blued the full length. Still another style is made of ⅜-in. stock and is intended for those mechanics who demand an extra heavy nail set of high quality. The centers are heavily knurled, both ends are tempered and the points are tested on steel. The catalog also gives attention to screw-driver bits and to tool-makers' screw-drivers made of the best steel, and the temper is said to be warranted. Other lines to which attention is invited are wood brace drills, bell hangers and electricians' drills and bit stock drills for metal or wood. The company suggests that when ordering drills, the "style" letter should be used so as to avoid any possibility of errors.

"Direct Drive" Wrought Iron Conductor Hook

Heretofore the construction of conductor hooks has rendered the driving of them almost anything but an easy matter for the mechanic had to contend with bending and twisting and not infrequently with bruised fingers. In order to overcome these drawbacks, the Milwaukee Corrugating Company, Milwaukee, Wis., has just placed on the market what is known as the "Direct Drive" Wrought Iron Conductor Hook, an illustration of which is presented in Fig. 7. The point is made that this hook is as easily driven as an ordinary nail, the full force of each blow in driving being obtained and at the same time making drive more positive. The hook is made for both wood and brick and for round and square conductor pipe single and double drive.



Fig. 7—"Direct Drive" Conductor Hooks

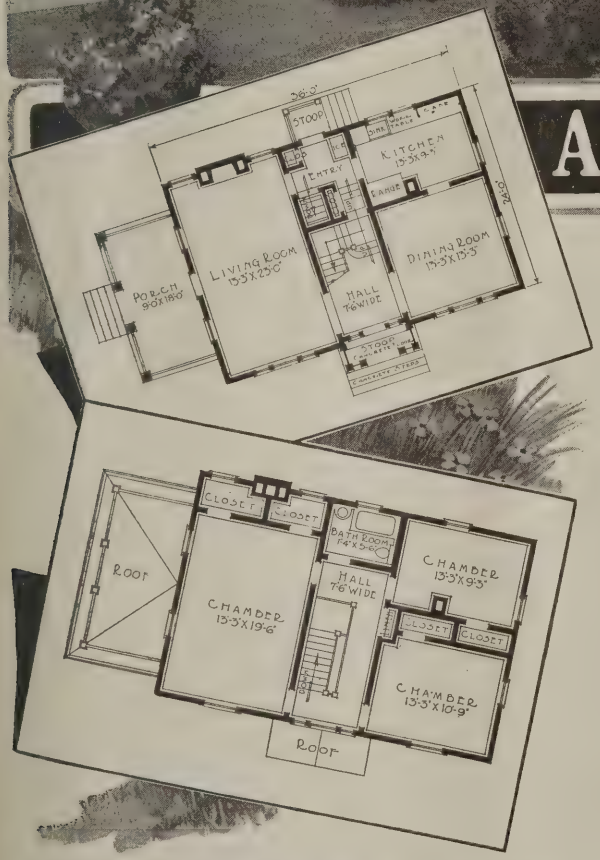
Profits for Contractors in Installing Store Fronts

The reports from builders and contractors in all parts of the country which have been received by the Detroit Show Case Company, 483 Fort Street West, Detroit, Mich., indicate that 1917 will witness a vast amount of work in which new store front construction will be an important factor. There was a time when builders for the most part were not greatly interested in store front work because of the general lack of a fixed idea

(*Continued on page 26*)



At Guaranteed Prices!



Quicker Service — Bigger Profits Better Goods!

Let us prove this. We want to show you how you can **increase your profits.** All we want you to do, Mr. Contractor, Mr. Carpenter, Mr. Builder, is to send us the coupon—or a post card—for our book, "Gordon-Van Tine Homes." We will send it to you—anywhere—and write you at the same time.

The fact that **we serve 10,000 contractors, carpenters and builders regularly** demonstrates that our service, material and **wholesale** prices are **right** and that we are making money for them. And we can make it for you too.

As evidence of our satisfactory service, consider the **order after order** we have received from concerns building employees' homes in quantities—the Chicago-Wilmington & Franklin Coal Co. Chicago, Ill.; Atlantic Mills, Stottville, N. Y.; Chicago Portland Cement Co., Oglesby, Ill.; Home Building Co., Clintonville, Wis., etc., etc.

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No matter where you live we guarantee safe and prompt delivery. We have customers everywhere. And all material is sold at **"mill-to-builder" prices. Guaranteed Costs** with **no extras.** You can safely figure profits **in advance.**

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Our free book, **"Gordon-Van Tine Homes,"** prices houses **both Ready-cut and not Ready-cut.** Shows **over 200 homes**—many **adapted from plans of America's best architects** but for **inexpensive** building. Tested and **proven** by being **built** in **every** State. References on request. Remember, three banks and over **100,000 customers** vouch for us. Use coupon.

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The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

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on the part of the retailers. Not so very long ago it was difficult to make sufficient profit on the construction of a store front to pay for the time and work as changes in plans were numerous and there was lacking a store front standard to serve as a guide. To-day, however, this branch of building is attracting the attention of contractors and they are making a substantial profit on the work. Retailers have been educated up to the understanding that good store fronts cost money and as good work is greatly to be desired, cheap fronts are now uncommon instead of the rule. In developing store front construction during the past twenty-eight years, the Detroit Show Case Company has come in such close touch with contractors and builders that they operate with complete understanding of their requirements. "Desco" store front construction is the company's latest development and its users are greatly pleased with its simplicity and general satisfaction which it gives wherever installed. The moderate cost of "Desco" is also another means of making this branch of building more profitable for builders and contractors.

Sound-Deadening Floors and Walls in Schoolhouses

The necessity of having walls and floors of schoolhouses as well as of other buildings sound-proof is too well recognized to admit of serious argument, and next to light and ventilation, is probably the most important item in schoolhouse construction. It is a part of the problem of acoustics which presents itself in two phases, namely, the conveyance of sound and its confinement within its own sphere of usefulness. The necessity of preventing the sounds of one school room from penetrating into another is now generally recognzied and has led to exhaustive inquiry into the various methods and materials to be employed for accomplishing it. It is known that the ordinary plaster and timber construction constitutes a very imperfect barrier to the passage of sound, plaster being at all times a poor non-conductor while the timbers often increase the difficulties, each one forming a medium to convey the sound. It is therefore, necessary to line the floors and walls with some material that will break up and absorb the sound-waves and which will also at the same time meet other requirements such as durability, reasonable cost, hygienic properties, etc.

As being of interest along this line is the twenty-four page booklet profusely illustrated with half-tone engravings of schoolhouses scattered all over this country as well as some abroad, which has just been issued from the press by Samuel Cabot, Boston, Mass., and bears the suggestive title of "Schoolhouse Acoustics." Every building illustrated in the booklet is said to be sound-proofed with Cabot's Deafening "Quilt," which is composed of a peculiarly laminated matting of cured eel-grass held in place between two layers of tough manila paper by "quilting," whence its name "Quilt," which is the registered trade mark of the material. Eel-grass was selected for the filling after exhaustive tests of that and other materials for four very important reasons. First because the blades are long and flat, and when felted as they are in the "quilt," they form minute dead air spaces, making the absorbent cushion which is necessary to break up and dissipate the sound-waves and which is said to be impossible with a round fiber. Second, because ell-grass contains Silicon to a large extent in place of the carbon of plants that grow in the air and therefore is an effective fire-resistant. Third, because it is indestructible by decay and repels insects or vermin; and fourth, because it is very tough and does not lose the elasticity which is so necessary for non-conducting purposes.

An interesting method of sound-proofing was carried out in connection with the construction of the practice rooms in the new music school of St. Paul's Girls' School at Hammersmith, England, where Cabot's three-ply Quilt was used. The illustrations in the booklet showing

(*Continued on page* 28)

Get in Line for Permanent Roofs

By using nails that will last as long as the shingles you lay. GET—

Zinclad

SHINGLE NAILS

for every shingle roof. These nails will last a generation and are really the cheapest when measured by the years of service they give on the roof.

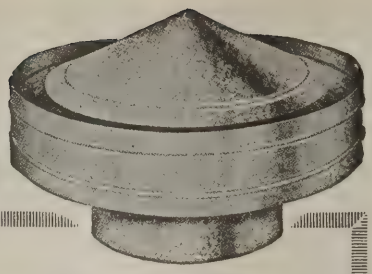
Zinclad Shingle Nails are sold by dealers in 32 states. If not sold in your city write us direct for samples and prices.

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Practical—Durable—Economical

Willis Ventilators are backed by twenty-five years of successful ventilating experience. We have incorporated in the Willis every modern feature consistent with Guaranteed Good Service; and have retained all the time-tried and proven features which distinguish the Willis as a RELIABLE Ventilator.

Simple Construction; nothing to get out of order. Very Durable; manufactured from heavy gauge heavily galvanized iron. Prices very reasonable, assuring you a good profit. Carried in stock for prompt shipment. Made in several styles, and sizes to care for your particular requirements.

Our new 180 page, handsomely illustrated Catalog will be sent Free to any interested Builder upon request. This Catalog covers our entire line of well known Sheet Metal Products.

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Combined Level and Transit

For Architects Builders Contractors

For use as a level or for taking vertical sights.
Why pay for a surveyor's or engineer's transit when this instrument will take your angles?
The price is right.
Our exclusive feature: Patented one piece phosphor bronze axis, by means of which level is converted into a transit in a few seconds without screws needing adjusting.
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schoolhouses in all parts of the country where Quilt has been successfully used afford an idea of the wide vogue which it has obtained among architects, builders and educators generally. As to the fire-resisting qualities of Cabot's Quilt, there are a number of remarkable testimonials presented, these coming from architects in various sections of the country.

Architects' Manual on Arkansas Soft Pine

A valuable book entitled "Architects' Manual on Arkansas Soft Pine" and distributed by the Arkansas Soft Pine Bureau, 420 Bank of Commerce Building, Little Rock, Ark., gives a complete description of the wood as to its origin, individuality, physical characteristics, proper uses, finishing, painting formulas, etc., as well as standard molding designs and grading rules. The molding designs and trim details are good sized reproductions of line drawings and occupy 40 pages. A table of board measure and the average weights of Arkansas Soft Pine when worked to standard sizes are also given. The book is undoubtedly worth while to any architect or builder and we understand that it will be furnished free to interested readers of THE BUILDING AGE who apply for it.

Concrete Mixers

Illustrations and descriptions of the latest types of concrete mixers manufactured by the Yaeger Machine Co., 216 West Rich Street, Columbus, Ohio, are contained in a new catalog sent out by this concern under the title, "Concrete Mixers." Particulars are given concerning the drum, which is of the single opening, tilting type; also of machines with power loading, mixers on trucks or skids, etc. There are also illustrations showing the mixers in actual use.

Repairing and Building

An attractive booklet entitled "Repairing and Building" is being distributed by Bird & Son, Dept. B., East Walpole, Mass. This booklet contains numerous illustrations of all sorts of buildings upon which Neponset shingles have been used. The booklet also gives a general description of the construction of the product and also tells something of Neponset Paroid roofing and Neponset wall board. Illustrations of interiors show some of the beautiful effects which may be gained with this material. It is interesting to note that the line drawings presented in connection with the description of this wall board were reproduced from a recent issue of THE BUILDING AGE. The company is also distributing folders colored in imitation of the effects gained by the use of Neponset twin shingles, information concerning their merits and construction being also given in the folder.

Growth of Kellastone Business

It is stated that during the past year the manufacturer of Kellastone has rapidly outgrown the previous facilities and the factory which has been moved from Argo to Waukegan, Ill., has been greatly enlarged so that the daily output has been increased many times over. The executive offices have been recently moved to more spacious and elegantly appointed quarters in the Mallers Building, Chicago, Ill. The entire floor space in these offices has been covered with one of the company's chief products—Kellastone composition flooring in a cheerful yet subdued color scheme. This material, it is claimed, very largely deadens sound while at the same time it gives an unusual environment of quietude and elegance. Kellastone stucco is said to be solving many of the problems of an exterior building material and is rapidly growing in popularity with architects, builders, contractors and home owners generally. It

(*Continued on page* 30)



Gedney Farm Hotel, White Plains, N. Y.,
Kenneth M. Murchison, Architect.

WHY WAS BAYONNE ROOF AND DECK CLOTH CHOSEN?

When the contractors faced the problem of covering the roofs and porches of the Gedney Farm Hotel, they decided on

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They wanted a material lighter than metal—something which could be put on easily, to last for years—in all kinds of weather.

They wanted canvas, but they knew that ordinary roofing canvas would not do. They were afraid to risk the buckling and cracking which always result from laying canvas on wet paint. They knew the expense and trouble of laying canvas that way.

Bayonne Roof and Deck Cloth proved to be exactly what they wanted. Its special process of manufacture made it "different."

It had no pores to be filled with paint after laying. It had "body."

They laid it on dry boards—and **then** painted it. And there are no bubbles, no cracks, no ridges on this Bayonne-covered structure.

It's stood every test of wear and weather. It gives real service, wherever service is needed.

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A recent canvass of hardware stores again verified the fact that by far the greatest number of saws sold to mechanics are

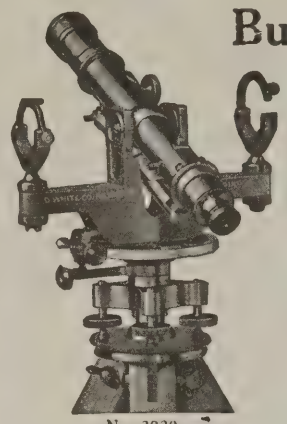
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No. 2020

Buy a "WHITE" and Level Satisfaction

The "White" convertible level is **so accurate, so dependable, so durable** that you can't buy one without getting a full measure of level satisfaction along with it as hundreds of contractors will testify. **Accuracy** and **durability** are spun right into this improved convertible level from the first. Let us send you one for free ten days' trial. Circular describes the new level and quotes prices—**ask for it.**

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN

Myers Wire Wall Ties

6 and 8 inches long. For Solid Brick and Concrete Work.

For Veneer, Solid Brick and Concrete Work. Saves nails, time and labor, consequently money. If your dealer will not furnish our Ties, order from us and we will ship direct or order shipped to you from nearest dealer.

Send for samples and prices. 1000 *in a box.*

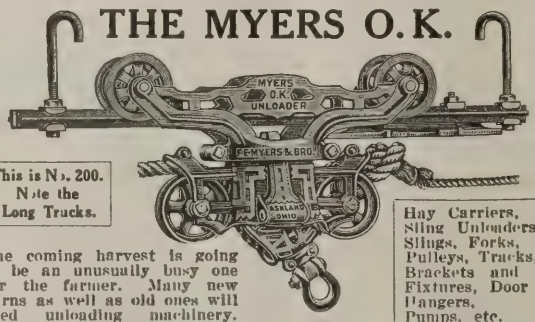
Patent Pending

For Veneer Work 3½ inches long

Saves 40 to 50 cts. per thousand on nails.

Mercer Mfg. Co., Mercer, Pa.

THE MYERS O.K.



This is No. 200. Note the Long Trucks.

Hay Carriers, Sling Unloaders, Slings, Forks, Pulleys, Tracks, Brackets and Fixtures, Door Hangers, Pumps, etc.

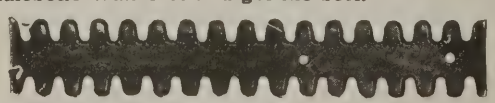
The coming harvest is going to be an unusually busy one for the farmer. Many new barns as well as old ones will need unloading machinery. Myers can furnish all the equipment necessary for the unloading of hay, grain, peas, beans, etc., from the wagon into the mow. Every outfit is guaranteed to give satisfactory service.

Now is the time to recommend and install the MYERS, including Unloaders, Forks, Slings Pulleys, etc. Catalog on request.

F. E. MYERS & BRO., Ashland, Ohio. Ashland Pump & Haytool Works

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞, weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-888 Progress St. Pittsburgh, Pa.

is said to possess great resistance to strains and stresses, thus preventing annoying cracks; to be elastic and free from contraction and expansion due to temperature changes and to be adaptable to any color scheme or finish that may be desired. The company has issued an interesting work profusely illustrated and entitled "The Story of Kellastone," a copy of which can be secured by any reader by writing to the National Kellastone Company at the address given.

Schoolroom Heater Providing Hot Water

A demand from executives of normal schools and colleges that facilities be provided for hot drinks and hot lunches in rural schoolhouses has resulted in improvements in the Columbia schoolroom heater, made by the Columbus Heating & Ventilating Company, Columbus, Ohio, and illustrated in Fig. 8. The heater, which has recently been placed on the market, has a large reservoir for heating water, with a spigot on the outside, thus

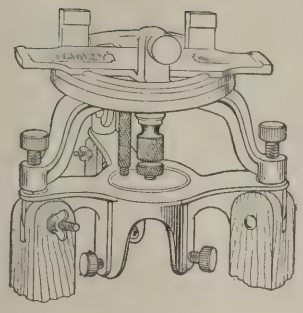


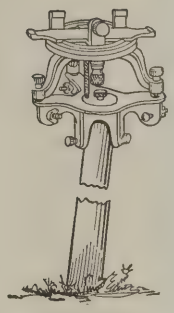
Fig. 8—The "Columbia" Schoolroom Heater

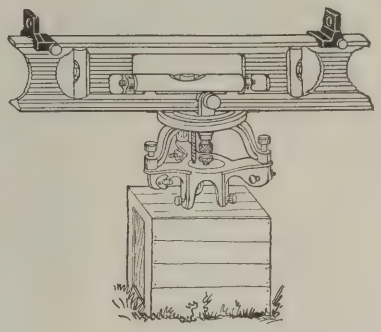
providing hot water for various uses, and a large cast-iron plate arranged for heating the lunches and making a hot drink to go with the hot lunch. These additional features are brought out in the illustration, and the company anticipates a large demand for this product as soon as it is brought to the attention of prospective users. It also believes that these improvements present additional talking points for the aggressive furnace dealer doing business in rural communities, and should pave the way to much increased business this year, in new and remodeled work. The heater is attractive in appearance and compact, being designed to supply a good volume of fresh, warm air. It is equipped with outside air connections to provide several air changes per hour. The heater is of the all-cast-iron type, with a heavy firepot, cup joints and a one-piece base. The casing is built of planished steel and is doubly lined with asbestos. It is provided with a large air chamber and a roomy ashpit, and the grates are of the rocking type, which may be lowered to remove clinkers.

(*Continued on page* 32)

Stanley Tools







Stanley Improved Leveling Stands

A Stanley Leveling Stand used in connection with a wood or iron level, and a pair of level sights, will be found in many cases a very satisfactory and inexpensive substitute for the more expensive surveyors' instruments.

By its use one can readily determine levels from a given point to one at a distance, such as locating or setting the profiles for foundation work, ascertaining the proper grades for drains, ditches, etc.

It can be placed on a stake or crow-bar and adjusted to a horizontal position though the stake or crow-bar may not be exactly perpendicular. The Base is also provided with three wings so that it can be attached to the legs of a tripod. A thoroughly practical tool. Price of Stand with a 12-inch metal level and a pair of level sights, $4.50. Price of Stand only, adapted for either wood or metal level, $2.00.

Send for special circular.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

A Carborundum Sharpening Stone Keeps My Turning Tools On The Job



RIGHT on my lathe—right handy where I can always reach it, is a Carborundum Round Combination Stone. Every once in a while I give my chisels a rub over its free, fast cutting surface and back comes the edge keen and smooth.

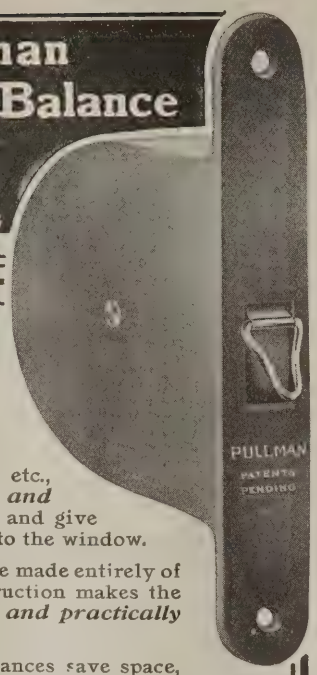
That Carborundum Stone keeps my turning tools on the job—keeps them clean and smooth cutting. It holds its shape and it never glazes. Lasts almost as long as the tools themselves.

Your Hardware Dealer has Carborundum Sharpening Stones or you can send direct

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

Pullman Unit Sash Balance

Cheaper Than Weights and Cords



PULLMAN Unit Sash Balances should take the place of cords, weights and pulleys in every new building large or small, residence, factory, school building, etc., etc., *because they cost less and last longer,* are fire-proof and give a much neater appearance to the window.

All Pullman Balances are made entirely of pressed steel. This construction makes the Balance *lighter, stronger and practically noiseless.*

Pullman Unit Sash Balances save space, permit of much narrower mullions, thus giving more lighting area.

OVER SIX MILLION IN USE

Recommended by hundreds of Architects. Approved by the Fire Underwriters' Laboratories and may be used in fireproof buildings.

Write for illustrated descriptive catalog with blue print.

PULLMAN MFG. COMPANY, 8 Industrial Street, ROCHESTER, N.Y.

Pullmanize Your Windows

"YANKEE"

Plain Screw Drivers

STANDARD No. 90
CABINET No. 95

They cannot loosen in the handle, in use or abuse.

You have our Guarantee.



They are durable as the high grade steel that composes them, and will render faithful service for generations. The comfortable handle and various lengths of blade make them suitable for all classes of work.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.
Lehigh Ave., Philadelphia, Pa.

New Policy of Federal Motor Truck Company

Greater service to the users of its motor trucks is provided for in the inauguration of a new policy by the Federal Motor Truck Company, 31 Leavitt Street, Detroit, Mich., which requires dealers to keep in stock the repair parts. This will insure the elimination of unnecessary delay to the Federal user who requires repairs of a nature which is generally referred to the factory. Another feature of the new service policy is to establish all-night repair shifts in most of the Federal service stations. This will permit a truck to be run into a service station over night and be ready for service again the next morning.

Willis Hoghouse Skylights

With a view to meeting a well defined demand for this special class of goods, the Willis Manufacturing Company, Galesburg, Ill., has brought out a complete line of hoghouse skylights, an illustration of one of which appears in Fig. 9. These skylights are claimed to have many features of interest to every contractor who takes care of rural building requirements. The skylights are designed so that very little work is required to set them in place and they are at the same time water-proof



Fig. 9—The Willis Hoghouse Skylight.

without the use of putty. In their construction the best quality of galvanized iron and high grade workmanship are used thus producing a skylight which it is claimed will meet every requirement and give good service. In the type here shown, there is an opening device for ventilating purposes together with other features gained from twenty-five years' experience in the manufacture of high quality skylights. At the present time the company is making three sizes and four styles of hoghouse skylights, thus giving the builder a wide range so as to suit any particular job.

A New Sheet Metal Concern

The members of the building trades will be interested in learning that A. D. Mellor and A. Hamburger, formerly manager of the contract department and chief engineer, respectively, for the National Fire Proofing Company, New York City, have just opened an office at 103 Park Avenue, New York, under the name of Mellor & Hamburger for the purpose of marketing the sheet metal building materials of the Berger Manufacturing Company requiring engineering services. We understand that they will make lump-sum bids for Berger's metal lumber and corrugated steel cores, metal lath and reinforcing bars required for long span floors; also prepare complete detail drawings for use in the field. In addition they will furnish specifications and quotations for waterproofings, damp-proofings, concrete floor hardeners, etc.

(*Continued on page* 34)

COMPO-BOARD

Cuts Cost of New Work

COMPO-BOARD is the one wall lining that can be used in new jobs without liability of buckling and cupping between studding. Its core of wood gives it strength to withstand a strain of 650 pounds nailed on studding with 16" centers. It has proved its low cost, strength and highly satisfactory service in school classrooms where blackboards are essential, on ocean-going steamships as lining for staterooms, saloons, etc., and in many other places where it has successfully withstood terrific strain.

It is elastic enough to be bent or shaped, without breaking, to meet a variety of conditions—such as curved ceilings, alcoves, store window display backgrounds, etc.

If you would be *modern* in your ideas about building, you owe it to yourself to get acquainted with Compo-Board.

Write for free sample and interesting book.

The Compo-Board Co.
5778 Lyndale Ave. N.,
Minneapolis, Minn.



Pass on, Mr. Repair Man!

For years and years—

This RU-BER-OID Roof will need no repairs.

For RU-BER-OID is sparkproof, rotproof, rustproof and weatherproof.

It contains nothing that can crack, warp, melt or leak.

Many imitations LOOK like RU-BER-OID. Ask your dealer to show you the *genuine*, with the "Ru-ber-oid Man" on the roll.

Made in Slate Gray, Tile Red and Copper Green.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete



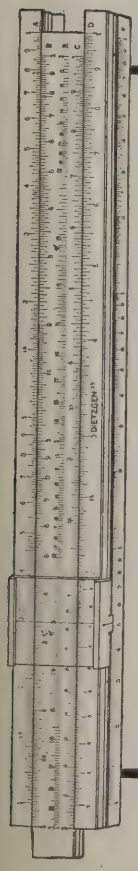
Pronounced "RU" as in RUBY

RU-BER-OID ROOFING

COSTS MORE - WEARS LONGER

MADE BY THE STANDARD PAINT COMPANY, NEW YORK, BOSTON, CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid



The Phillips Slide Rule

enables many equations in Civil, Mechanical and Electrical Engineering to be solved with ***greater rapidity and accuracy*** than possible with any other rule. It is of wide range and precision.

$$65^2 \div (51 \times 85)$$

can be solved with ***one slide movement.*** Try it on ***your*** rule. Equipped with frameless indicator—all figures always visible.

Send for Circular "B-2"

Eugene Dietzgen Co.
Manufacturers

Chicago New York San Francisco
New Orleans Pittsburgh Philadelphia





Richards-Wilcox Accordion Door Hardware

for sliding partitions in schools, churches, clubs and other public edifices.

Benefits the Builder's Business

Every dollar invested in R-W Hardware for sliding partitions not only pays a handsome stock dividend of service to the owners of the building but earns a high rate of interest in favorable public opinion for the builder who installs it.

Sold by the best hardware trade everywhere

Write for interesting illustrated book, "Sliding Door Hardware for Parallel, Accordion and Flush Door Partitions." Sent without obligation.



—PLAN—

Richards-Wilcox Manufacturing Co.

SAN FRANCISCO LOS ANGELES NEW YORK CHICAGO

AURORA, ILLINOIS, U.S.A.

PHILADELPHIA MINNEAPOLIS BOSTON ST. LOUIS

Richards-Wilcox Canadian Co., Ltd., London, Ont.

"A hanger for any door that slides"

LIGHT WEIGHT

Ship Adze



Just what you have been asking for. Same quality as our regular pattern but a light Adze.

Made in both the plain and lipped pattern. Our new catalog is ready. Drop us a card.

Ask your dealer for White Adze. Insist upon seeing our trademark.

THE L. & I. J. WHITE CO.
100 PERRY ST. BUFFALO, N. Y.

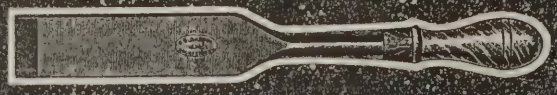
ORIGINATORS
OF
SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government** for over **30 Years.**



The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.

MACK & CO.



YOU will always feel secure when you use Barton Planes and Edge Tools. The making of keen edged tools that hold their sharpness is our hobby. If your dealer won't supply you we will.
There is some mighty interesting and profitable reading in "The Carpenter's Catalog" and "True Stories." Both free, of course.

Brown's Race & Platt St., Rochester, N.Y.

Catalog of Woodworking Machinery

An attractive catalog of 207 pages is being distributed by Machinery Merchants, Inc., 2070 Hudson Terminal, New York City, which is the distributing agent for the Hercules Machine Company, as briefly noted in our May issue. This catalog illustrates the latest improved type of woodworking machinery manufactured by the company, the machines embodying many improvements over the early patterns which have been suggested by actual experience in their use under all conditions. The catalog covers in a comprehensive way the subject of woodworking machinery, and illustrates and describes a very extended line, as well as some other features which are of undoubted interest to the builder operating a woodworking shop. A comprehensive index renders it easy to refer to any machines in the catalog. Interesting information telling how to figure speeds and diameters of pulleys, etc., how to braze band saws, the care of small circular saws, units of work, formulae for safe loads in mill construction, etc., are also contained. Another feature in connection with the catalog is the space devoted to freight rates from the factory to various important places so that the builder may approximately estimate his delivery prices on the company's product per one hundred pounds. There is also a general code which will facilitate ordering by telegram. In view of the many changes which have taken place in woodworking machinery during the past ten years, this catalog will prove especially valuable to the up-to-date builder.

Mueller Pipeless Furnace

The builder interested in pipeless furnace heating will find some valuable information contained in the folder issued by the L. J. Mueller Furnace Company, 197 Reed Street, Milwaukee, Wis., illustrating and describing the salient features of this furnace. It is said that this pipeless furnace burns hard or soft coal, wood or coke and saves 35 per cent in fuel. The claim is made that the furnace will go into any cellar no matter how small, while if there is no cellar, it is an easy matter to dig a pit large enough to contain the heater.

TRADE NOTES

"The House That Found Itself" is the title of an attractively illustrated and printed booklet which is being distributed by the Murphy Varnish Company, Newark, N. J. The booklet contains a little story which points out how essential a good varnish is to the appearance and lasting value of a floor. Photographic reproductions of attractive interiors are numerous and these are accompanied by a short caption which points out the methods which were used to bring about attractive results.

The unusual pencil exhibit of the Joseph Dixon Crucible Company, Jersey City, N. J., at the Advertising Men's Association of Oakland, Cal., attracted a great deal of attention by reason of its originality. The exhibit consisted of a pencil 75 ft. long and 30 in. in diameter, which was supported by eight girls who each took a place in a section of the pencil and at a given word stepped out to the full length of it, making a very pleasing effect.

Bulletin A-5, entitled "Modern Methods In Concrete Construction," is being distributed by the Hydrated Lime Bureau of the National Lime Manufacturers Association, Pittsburgh, Pa. This bulletin contains illustrations of various structures and jobs in which hydrated lime was used.

(*Continued on page* 36)

KOLESCH
"BUILDERS"
Tilting Level



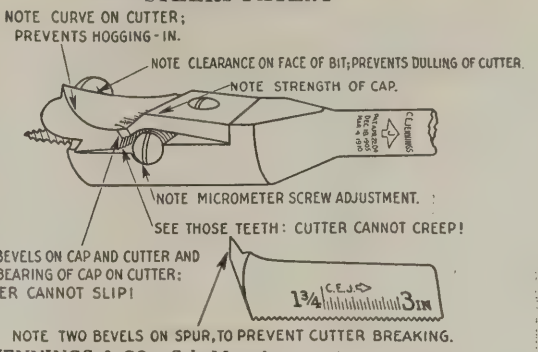
No. 7850

Designed particularly for the leveling and plumbing of walls, giving lines and levels for buildings, laying out angles, grading streets, sewers, drains, etc. Sturdily built for durability, yet sensitively accurate.

Sold complete in a polished box with plumb bob, adjusting pins, metal trivet, book of instructions, and tripod for $57.50

KOLESCH & COMPANY
138 Fulton Street New York, N. Y.

C. E. Jennings ARROW HEAD Trade Mark Expansive Bit
STEERS PATENT



C. E. JENNINGS & CO., *Sole Manufacturers*, 71-73 Murray St., N. Y.

"Ideal" Umbrella Holder



An attractive, durable piece of furniture. Occupies small space; can be filled or emptied without halting a line of pupils as they pass it. Regular school size holds 48 umbrellas. We ship it in its own drip pan—package 4" x 15" x 39", total weight 25 lbs. Sample on approval, if all express charge is paid.

THE W. J. CLARK CO., Salem, Ohio

CALDWELL SASH BALANCES UNIFORM MORTISES



Patent Pending

For use in all classes of new work

Box frames unnecessary

Mortises cut at mill reduce cost of installing. Counterbalance sashes at any given point. They outwear ordinary weights and cords. Unaffected by atmospheric conditions.

Cheapest method for modernizing old windows, as alterations in sashes and frames are not necessary. Sashes should be weighed before ordering.

Write for Circular

Caldwell Mfg. Company
5 Jones St., Rochester, N. Y.

Pearson's Automatic Shingle Nailer



Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

PAYS ITS COST ON ONE JOB

Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.

List price $7.00 (but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools

COPPER CABLE SASH CHAIN



Thomas Morton
245 Centre Street
NEW YORK

COPPER CABLE
STEEL CABLE
CHAMPION METAL
STEEL CHAMPION

SASH CHAINS
CHAINS

For Suspending Heavy Doors Gates, Etc.

All of SUPERIOR QUALITY



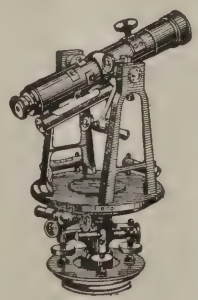
CHAMPION METAL SASH CHAIN

Think—

Wouldn't it be better for you to possess a Beckmann Architects' Level or Builders' Transit and have the satisfaction of knowing all lines, levels, angles and elevations are exactly correct?

And think of the time and trouble you save on all construction work! Beckmann Transits and Levels are the lowest price good instruments on the market.

Let us prove it to you. Send for Booklet D today.



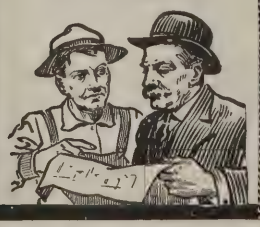
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The L. Beckmann Company
Established 1874
300 Jackson St., Toledo, Ohio

We've helped hundreds of men in the Building Lines to the **Big Job** and the **Big Pay Envelope.** We can help **you.** Let us tell you how. A few dollars and your spare hours will do the job. Mail coupon today and get full particulars **free.**

CHICAGO TECHNICAL COLLEGE
Study at Home by Our New, Quick, Easy Plan
BUILDERS' COURSE in Plan Reading, Estimating, etc.

Mail the Coupon Now



CHICAGO TECHNICAL COLLEGE, 1020 Lake View Bldg., Chicago, Illinois
Gentlemen: I have marked with a cross (X) the branch or branches interesting me.

☐ Architectural Drafting	☐ Bldg. Superintendence
☐ Builders' Course	☐ Structural Drafting
☐ Estimating	☐ Structural Design
☐ Plan Reading	☐ Mechanical Drawing
☐ House Planning	☐ Machine Drafting
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Name.....
Address.....
Town.....State.....
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When properly laid, makes a neat, smooth, durable surface.

Easy to Lay. Saves Labor Costs

Con-ser-tex is easy to lay and greatly reduces the labor costs. It eliminates the necessity of expensive roof and floor lumber. You can make lower bids by using it on porch floors and roofs.

Indestructible

Con-ser-tex is a chemically treated cotton fabric which is not affected by the oil in paint—dry rot nor mildew. Neither is it affected by the elements nor climatic changes.

Praised by thousands. It's the ideal material wherever wear and tear is hardest. Sun parlors, halls, kitchens, roofs, etc.

WILLIAM L. BARRELL COMPANY
8 Thomas Street New York City

Chicago Distributor: Geo. B. Carpenter & Co., 430-40 Wells St.

California Distributors: Waterhouse & Price Co., Los Angeles. The Pacific Building Material Co., San Francisco.

Proud of his Work



An artistic job of brickwork well done is something to be proud of.

An artistic effect combined with permanence is something to be doubly proud of.

Effect and permanence in brickwork can only be secured by using the best mortar colors.

By mixing your mortar with the proper shade of color you can produce the most wonderful combinations.

The great coloring power, richness in tone of

Clinton Mortar Colors

and the fact that they will not fade or give trouble, has led most of the leading architects and builders to specify their use.

Let us send you samples and prices.

Clinton Metallic Paint Co.
Franklin Avenue Clinton, N. Y.

"The Way to the Artistic Home" is the title of an illustrated booklet which is being distributed by the Bridgeport Wood Finishing Company, New Milford, Conn. This tells an interesting little story of how some prospective home builders concluded to utilize finishes supplied by this company. The booklet is accompanied by a sample of cypress showing a smoked pearl finish applied to this wood and directions for securing the finish.

The April issue of the *Carter Times* contains interesting information upon various phases of painting. At this time of the year the country carpenter located near a body of water is often called upon to do boat painting and there is a valuable article upon this subject in the number before us.

Curtis Service is the title of the monthly house organ of the Curtis Companies, 1616-1716 South Second Street, Clinton, Iowa. The April issue contains as its leading feature an article entitled "The Equipment for Selling Homes." This deals with information that will particularly appeal to the home builder, helping him to decide upon his requirements. The issue also shows some of the results which have been gained by the use of Curtis woodwork, both exterior and interior, together with built-in features manufactured by this company.

The principal feature of the April issue of *Door-Ways*, the house organ of the Richards-Wilcox Mfg. Co., Aurora, Ill., is an article entitled "Improved Gable Doors," which illustrates and describes various types of doors for use in barn gables. There is also a clever joke column. The magazine is accompanied by a monthly calendar bearing the picture of an attractive girl at the steering wheel of an automobile, illustrating the caption "Taxi." On the opposite side of the calendar is pointed out the improvements made in transportation facilities and its parallel in the improvements made in hanging doors, especially when "R-W" hangers are used.

Photographs of attractive houses upon which thatched "Creo-Dipt" stained shingles have been used in securing the popular thatched roof effect are being distributed by the Creo-Dipt Company, Inc., 1030 Oliver Street, North Tonawanda, N. Y. These include reproductions of various styles of houses.

Motor trucks manufactured by the Federal Motor Truck Co., Detroit, Mich., are found operating under all sorts of conditions and in all sorts of places. From Bombay, India, comes the word that ahuge wooden barrel capable of holding hundreds of gallons of water has been mounted on a Federal chassis in the State of Mysore, India, by the Presidency, and is being used as the official water wagon, a custom centuries old applied to the modern method of transportation.

Two attractive *brochures*, describing and illustrating North Carolina pine, have recently been compiled by the North Carolina Pine Association, 71 Bank of Commerce Building, Norfolk, Va. Each contains colored panels showing how beautifully the wood takes different stains, pictures of old houses in which North Carolina pine was used, and various plans and pictures of new houses which have utilized this wood. It might interest many of our readers to know that Washington's home at Mount Vernon was built of North Carolina pine.

The problem of retaining men is one of the subjects over which many an employer has pondered, and the solution worked out by Henry Disston & Sons, Inc., Philadelphia, Pa., was considered worthy of publication in the February issue of *System*. The company has re-

(*Continued on page* 38)



THE DOVER

A new design of Corbin wrought bronze and wrought steel hardware, which is dignified, simple and pleasing. The deep modelling and high raised borders give an appearance of strength and weight. The sizes are appropriate for general use. The motives and their treatment are modern.

Any Corbin dealer can give you full particulars—or write to

P. & F. CORBIN

The American Hardware Corporation, Successor

NEW BRITAIN, CONN.

NEW YORK CHICAGO PHILADELPHIA

printed the article, which states how the personal relations of employer and employe are fostered, and how its high record for holding workers is gained.

The Turner Construction Company located for the past fifteen years at 11 Broadway, New York City, has recently removed to the corner of Madison Avenue and Thirty-eighth Street, where it has secured 24,000 sq. ft. of floor space. Among the contracts recently obtained by the company is one for a six-story reinforced-concrete factory building measuring 100 x 125 ft. in plan for the Endicott-Johnson Company of Endicott, N. Y., and one for the erection of a six-story service station 50 x 100 ft. for the Hudson Motor Car Company in West Sixty-eighth Street, Borough of Manhattan.

Gustavus W. Thompson and Walter D. Binger have formed a corporation under the name of Thompson & Binger, Inc., for the purpose of engaging in the design and construction of plain and reinforced concrete structures of all types. The offices of the corporation are 280 Madison Avenue, corner of Fortieth Street, New York City, and 516 Gurney Building, Syracuse, N. Y.

The Detroit Door & Sash Company, Detroit, Mich., has been incorporated with $25,000 to manufacture sash, doors, etc. The stockholders are Roswell G., Edgar A., Edgar G. and Carrie G. Curtis.

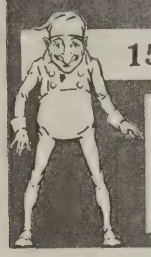
The last issue of Doorways, the house organ of the Richards-Wilcox Manufacturing Company, Aurora, Ill., contains as its leading feature an article entitled "Solving the Garage Door Problem," which is illustrated by scale drawings showing various details of construction and half-tone illustrations showing the appearance of the garage to which these details apply. Illustrations are also given of elevator door closers and checks, and of a window display featuring R-W products which is said to have brought big results. The issue is accompanied by a monthly calendar bearing the picture of an attractive girl holding a bunch of flowers and illustrating the caption, "Roses." On the reverse side of the calendar the applicability of this caption to R-W products is pointed out.

The Farm Bureau of the Portland Cement Association is conducting a campaign to help cement products manufacturers enter the cement stave silo business in sections of the country where no concrete silos are being built at present. A number of well-equipped plants in different parts of the country are now planning such a departure.

The Sam W. Emerson Co., general contractors, has removed to 1900 Euclid Avenue, Cleveland, Ohio.

(*Continued on page* 40)

GOODELL-PRATT

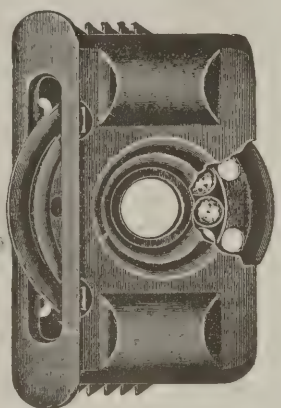


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Fasten automatically. No nails. No screws. Just bore 4 holes.

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FOUR NAILS at PRICE OF ONE
When You Buy Them
ONE NAIL in place of FOUR
When You Drive Them

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Reg. U. S. Pat. Office

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BECAUSE the Simplex has four times the head area of an ordinary roofing nail—hence four times the holding power, as head area is the all-important point in laying prepared roofing or sheathing papers. Demand Simplex Nails from your hardware dealer. Don't buy prepared roofing unless Simplex Nails are packed in the rolls. FREE samples sent on receipt of request accompanied by dealer's name.

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MADE IN TWO PIECES

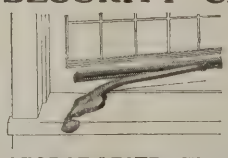


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The BEST BOOK of house plans published, containing 30 plans of modern, artistic homes. Sent postpaid for twenty-five cents in silver.
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Successor to John Henry Newson
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For both right-hand and left-hand casements. Can be opened as much or as little as desired, so that air can be admitted without also admitting rain or snow. Locks automatically, works easily. Gives a house a very distinctive appearance. Strong, durable, moderate price.

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An Up-to-the-Minute Builder

USES "TROUBLE-SAVERS" ON EVERY JOB

"Trouble-Saver" Carpenter Brackets are Trouble-Savers, Time-Savers, Labor-Savers, Money-Savers and LIFE-SAVERS.

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You have no big lumber bills, there's nothing to be lost, there's nothing to adjust, they can't get out of order—THEY'RE ALWAYS ON THE JOB.

SAFE, CONVENIENT, PRACTICAL, PERFECTLY RIGID, NO SIDE MOTION, SUPPORT A TON, EASILY TRANSPORTED, EASILY STORED, A WHOLE BRACKET, NOT A HALF BRACKET

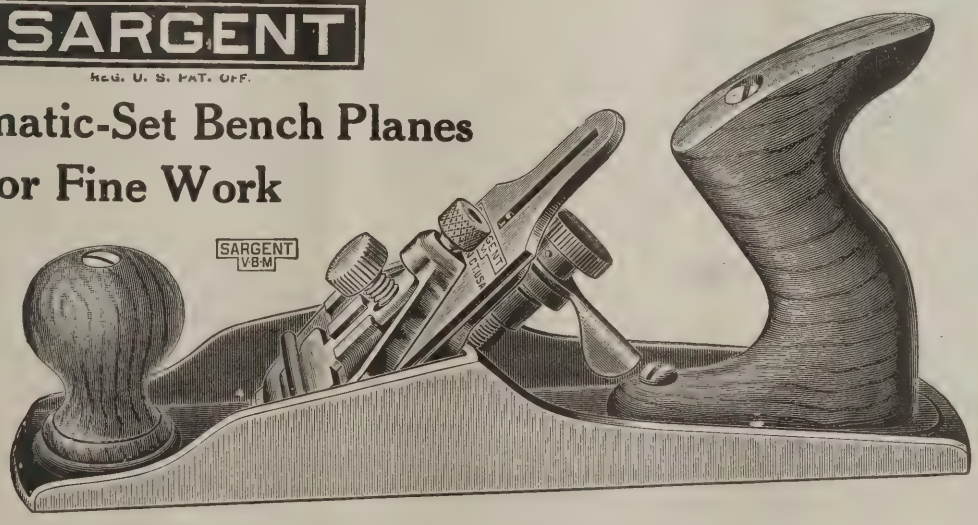
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Sargent Automatic-Set Bench Planes are best by trial and by the recommendation of America's best mechanics. They will do work requiring a finer degree of accuracy than any other plane on the market.

These Planes are made in six sizes with both smooth and corrugated bottoms.

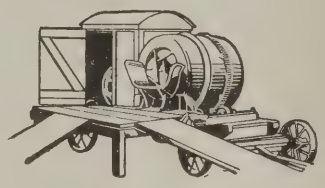
The great interest in these Planes on the part of tool-users shows that the advantages and points of superiority—solidity, compactness, simplicity, ease of adjustment and, most of all, the automatic-set feature—are apparent to mechanics.

Catalog of Planes, with full information about these Automatic-Set Bench Planes, will be sent free on request.

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"The Standard" Low Charging Concrete Mixer



Cuts Costs—Increases Production

Contractors all over the country have found that "The Standard" Low Charging Concrete Mixer actually reduces concrete costs one-third.

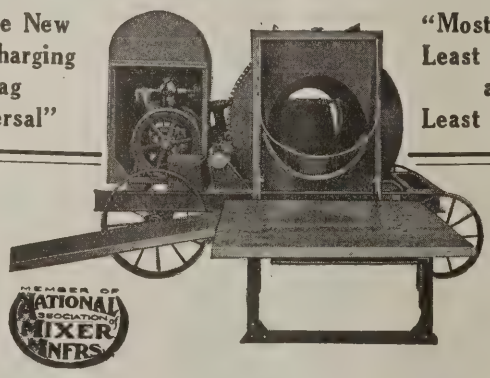
Send for our latest catalogue, which is full of interesting pictures and data. Just write to our nearest office to-day for your copy. Ask for catalogue No. 48.

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"Most Mixing Least Fixing at Least Cost"



Marsh-Capron Concrete Mixers Make Sure Profits

because they have wearproof features not found on other machines; they are simpler to operate; easier to understand; the surest mixers on the market because they stand up every day under heavy strain and never give trouble.

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Standard Mixers—Pavers—Grouters. Find out about them now

MARSH-CAPRON MFG. CO.

1462 Lumber Exchange CHICAGO

Branches in all important cities

The "Grinnell Automatic Sprinkler Bulletin," published quarterly by the General Fire Extinguisher Co., Providence, R. I., contains illustrations of plants equipped with automatic sprinklers. At the recent National Complete Building Exposition in New York City the company actively demonstrated the ability of its product.

We understand that the Hotel Commonwealth, soon to be erected in the Times Square district of New York City and which will be twenty-eight stories high, containing 2500 rooms, will be equipped throughout with the Campbell solid metal windows made by the Harry E. Campbell Company, 8 West Fortieth Street, New York City.

A folder illustrating and describing Neponset Twin Shingles is being distributed by Bird & Son, Dept. B, East Walpole, Mass. The illustrations are in colors and present a most striking effect. These asphalt shingles are said to be self spacing, and are approved by the National Board of Fire Underwriters.

The Kansas City office of the Portland Cement Association has been moved from the Commerce Building to the Rialto Building.

One of the easiest ways to avoid dampness in cellars and walls is by the use of a waterproofed cement, and valuable information concerning such a material is contained in a booklet entitled "Medusa Waterproofed Portland Cement," distributed by the Sandusky Cement Co., 624 Engineers Building, Cleveland, Ohio. Directions for using are given, together with specifications for stucco on metal lath; stucco on brick, stone, hollow tile, etc.; plaster for foundations, walls, floors, etc.; mortar for laying up brick and stone, also reinforced or mass concrete. Illustrations and testimonials are a feature of the booklet.

"Beautiful Boats and How to Care for Them" is the title of an attractive booklet which is being distributed by the Murphy Varnish Company, Newark, N. J. It describes the particular kind of Murphy varnish suitable for the various places upon a boat, both exterior and interior, while at the same time it presents directions for applying together with prices of the different kinds. As the booklet is timely and contains valuable information along the lines indicated above, it will prove of undoubted interest to the carpenter or builder who may be called upon to do a little boat painting.



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ALL SIZES AND DESIGNS

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Containing Plans of This House; Also a Supplemental Plate and Plans

Building Age

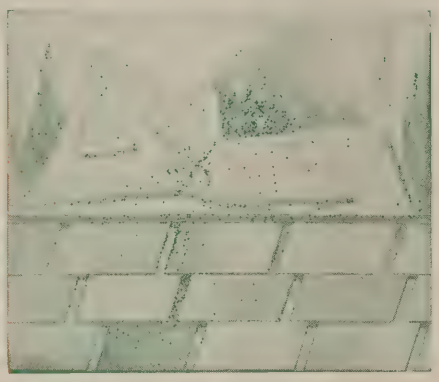
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To Get a Real Artistic Asphalt Shingle Roof

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Mottled Hudson Asphalt Shingles

(Pat. Applied for), Surfaced with Red and Green Crushed Slate in varying proportions creating the desired artistic effect. The Mottled Hudson Asphalt Shingles, on account of their High Quality and Artistic Beauty, were chosen for the roofs of the employees' houses, erected under the auspices of the American Brass Co. and the Scovil Mfg. Co. at Waterbury, Conn., by the W. G. Lynch Realty Co.

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Asphalt Ready Roofing Co., New York.
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For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips, Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

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Sales Office and Parquetry Factory, Rochester, N. Y.



BAY STATE Brick and Cement Coating has made this Sears-Roebuck warehouse of Seattle safe from wear and weather.

This Coating completely covers, beautifies and protects walls of concrete, brick or stucco.

It takes away the ugly blue-gray color of concrete and supplies a pure white or any tint you want. Bay State Coating is the sure-cure for worn walls. Send for free sample, then you'll know how it works. Booklet No. 19

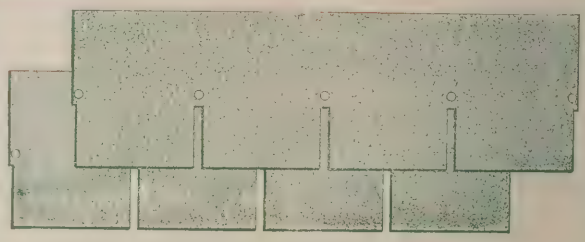
Bay State Cement Crack Filler is the first-aid treatment for walls that crack. It works wonders. Investigate.

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Paint and Varnish Makers Boston, Mass.
New York Office: Architects' Building

BAY STATE

Brick and Cement Coating

BAY STATE



The Famous Rex Strip Shingle

BIGGER SALES—BETTER PROFITS

DEALERS who are not stocking asphalt shingles—not getting good business from the line—are overlooking a very important source of profit, because asphalt shingles are enjoying probably a greater sale than any other type of prepared roof covering.

Dealers who carry Rex Strip Shingles are fortunate in having an item which they buy at a consistently uniform price. They are able to protect their profit margins.

The Flintkote line is very interesting. It includes many quickly saleable specialties—all of them thoroughly practical.

We have a proposition to submit. It is just as interesting to the user as to the dealer. Let us send our General Catalog No. 20, which describes and illustrates twenty-three Rex Products. It also gives valuable information about all kinds of roofing materials. It states clearly and completely our sales policy. It will be sent free on request.

Flintkote Manufacturing Co., Inc.

98 Pearl Street, Boston, Mass.

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The Building Age

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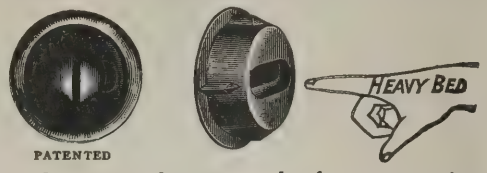
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Ives Patent Window Stop Adjuster

Prevents Drafts, Dust and Window Rattling



The only stop adjuster made from one piece of metal with solid ribs and heavy bed that will not cup or turn in tightening the screw.

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Samples and full information gladly sent.

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Cabot's Old Virginia White

A Soft Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as Lasting as Paint

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash. But paint was always "painty"—hard, cold, and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool, and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor painty like paint, although it costs less and goes farther than paint.

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Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt" Mortar Colors, Dampproofing, Waterproofings, Conservo Wood Preservative, etc.

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Send for samples to show your customers. IN-LADE design roofing will help build up your roofing business. Others are handling it with big success—why not you?
It may be laid over wood shingles, adding warmth, beauty and distinction to any home. No trouble, no painting; just unroll and apply. Made in rolls of red, moss green, and white. Approved by the National Board of Underwriters "Class C."

AMALGAMATED ROOFING CO.

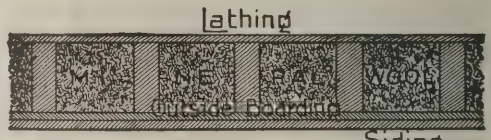
431 S. Dearborn Street Chicago, Ill.

Eastern Office
Fulton Bldg.
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Southern Office
18 So. 20th St.
Birmingham, Ala.







Section of Outside Wall of House, Showing Wool Between Studding.

Mineral Wool for Building

Mineral Wool has superseded all other materials used for similar building purposes because it does "a great work at little expense." A house lined with Mineral Wool has an indestructible, fireproof and vermin-proof guard; it protects the entire household. In the winter time it keeps the cold air out, facilitating proper heating and economy in fuel. In the summer it keeps the heat out.

This material, being of fibrous, inelastic composition, acts as a deadener and muffles all sound. It is considered the best insulator material on the market, making it a perfect refrigerating machine.

Mineral Wool makes life-long friends of all its users. If you are skeptical as to its power, let us demonstrate. We can prove all claims. Write us to-day.

U. S. Mineral Wool Co.

280 Madison Ave., New York

(Cor. 40th St.)



Section of Sound-Proof and Fire-Proof Partition. Can be used for outside walls also.

BUILDING AGE

NEW YORK, JULY, 1917



HOME OF EDGAR W. SMITH IN MADISON, WIS.—DESIGNED BY E. C. SMITH OF THAT CITY

A BUNGALOW OF UNIQUE ARRANGEMENT

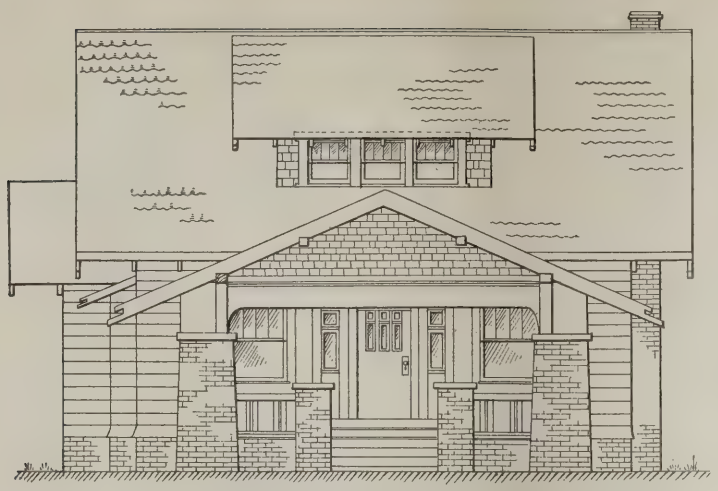
ORIGINALLY A ONE-FAMILY DWELLING CONVERTED INTO A HOUSE FOR THREE FAMILIES

STRICTLY speaking, a bungalow is a dwelling in which all the rooms are arranged on one floor, but in many instances the term is used in connection with a house which has several rooms in the story above. In the present case, which is one of that nature, a dwelling originally intended for a single family was converted after the work was well under way into a three-family affair, and in making the changes some very interesting features were involved. These are described by the architect who designed the work and who explains why they were made. He says: "Unfortunately the changes were not decided upon until the basement wall has been 'poured' or I could have improved on its somewhat, but I believe even as it was actually constructed, the arrangement has worked out satisfactorily.

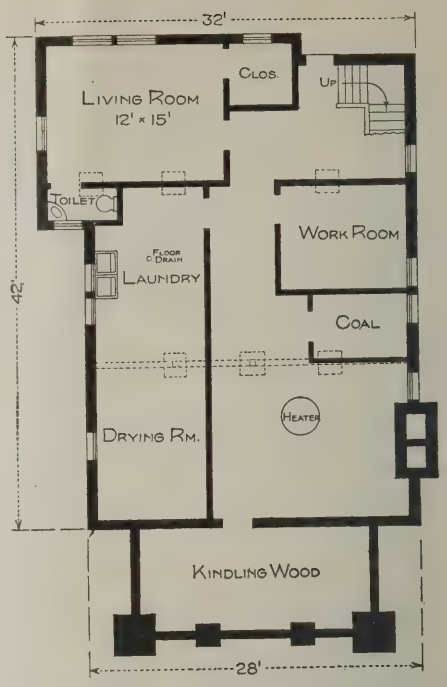
"In order to secure a separate outside entrance for the second floor family and at the same time an easy run to the stairs, it was necessary to move the partition on the right-hand side of the kitchen on the second floor to the left a distance of 3 ft. It also required the building of a small entrance porch and raising its landing floor to the level of the first floor. The entrance to the basement from the first floor was then made from the kitchen.

"The main stairway was left as it was originally planned and can be used or not according to preference. The space marked "screen room" on the first floor was plastered and is now one of the most attractive rooms in the home, being used as a summer dining room or as extra bed room, according to requirements.

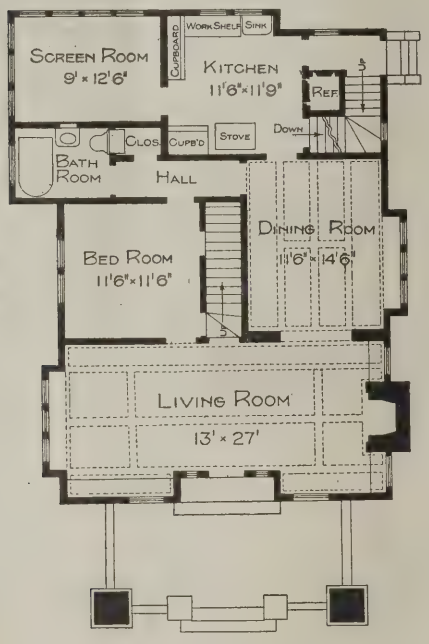
"The second floor was more easily converted into a separate family proposition than one would naturally think. By cutting out the hallway a good-sized dining-room was secured off from which we were able to obtain a small bed room,



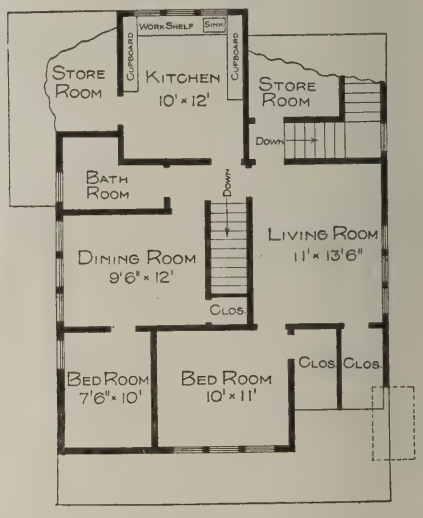
Front Elevation—Scale 3/32 In. to the Foot



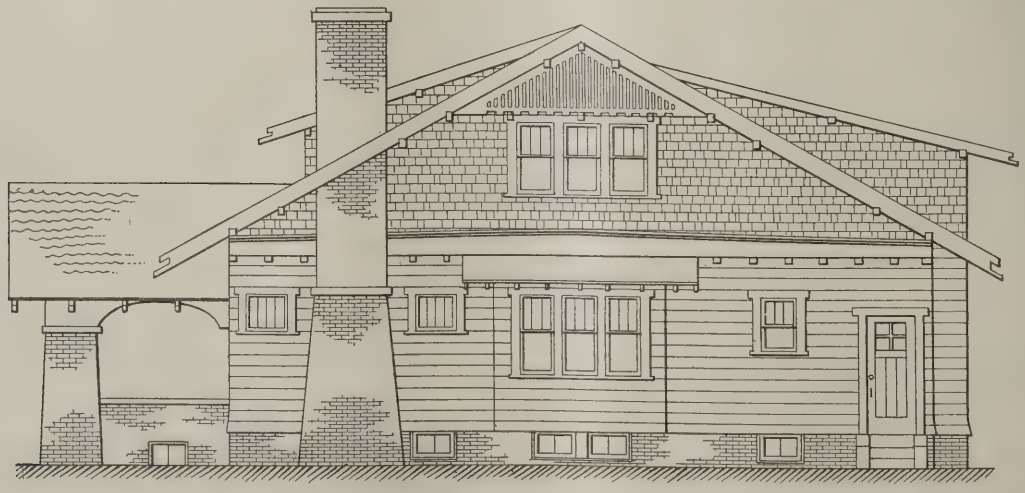
Basement Plan Showing Living Room for a Family of Two People—Scale 1/16 In. to the Foot



Main Floor Showing Rooms Occupied by Owner —Scale 1/16 In. to the Foot



Second Floor, Showing Arrangement of Rooms for Another Family—Scale 1/16 In. to the Foot



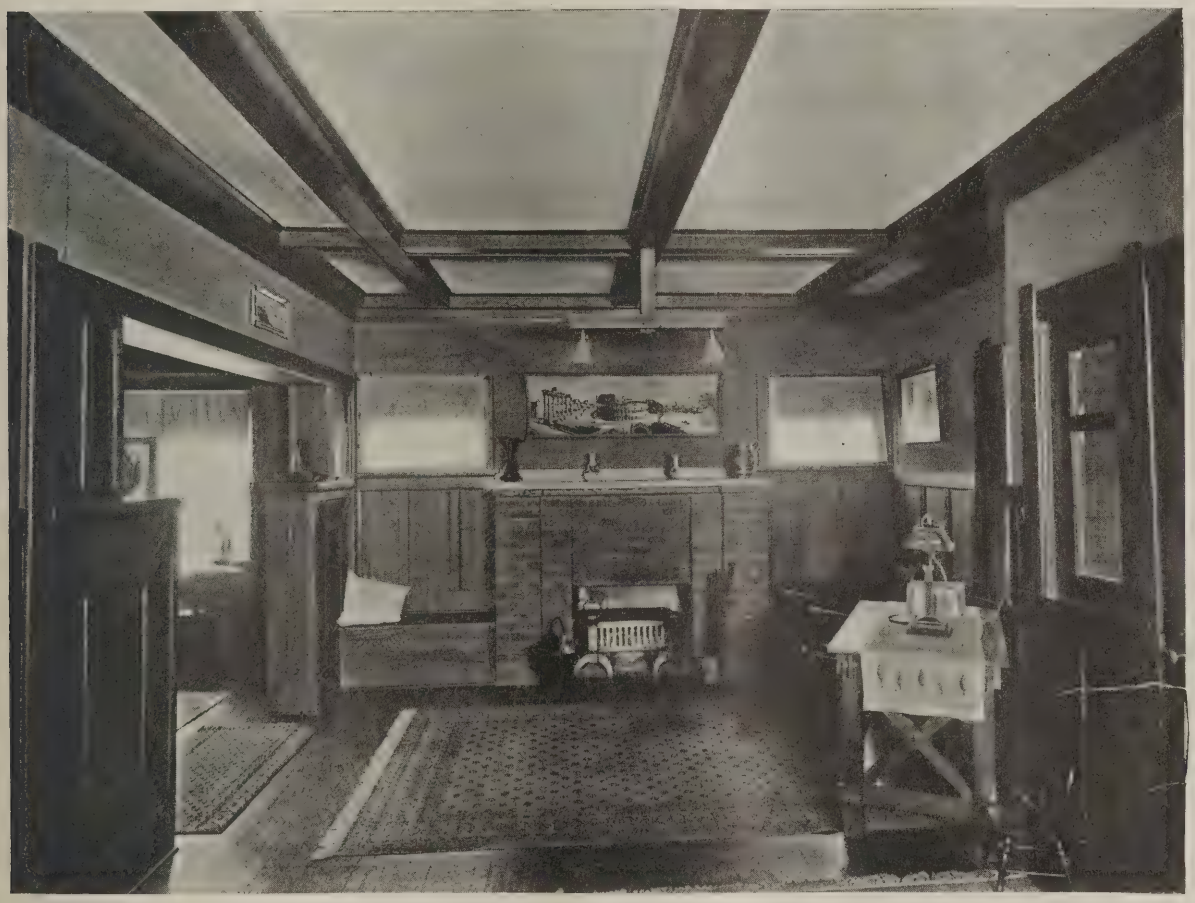
Right Side Elevation of the House Showing the Outside Chimney—Scale 3/32 In. to the Foot

the ceiling of which is naturally hipped at the rear. A very attractive and practical bath room was secured, as shown on the plan. The kitchen is of fair size, well lighted and has an abundance of cupboard space. The sink is set in the work shelf with cupboard for pots and pans underneath. The main entrance to the stairs leads out of the living room. The main bed room also opens from the living room.

"This would not really be considered a three-family house, although strictly speaking it has been used as such. Madison being a college city, there is a great demand for light housekeeping accommodations, especially by young married students who do not require a great deal of room and who are unable to pay a high rent. In the present instance the ground sloped in such a way that it was very easy to secure large windows for the southwest corner of the basement. We were able here to secure a room of about 12 x 15 ft. in size, which was plastered, finished in hard pine and given a maple floor. In connection with this room we secured sufficient space for lavatory and toilet, as shown on the plan, but no bath. There is gas connection for the stove and by putting in a good-sized overhead radiator sufficient heat has been furnished this room. There has always been a strong demand for it at a reasonable rate per week. It is really a very attractive room, well lighted, is cool in summer and is warm in winter.

"The reader can, perhaps, see from this how it is possible for three separate families composed of nine persons to live in this house and have each family perfectly adapted to its individual requirements. The owner and his wife occupy the first floor and have all the room they really need.

"The ordinary objection to many bungalows is that the low pitch roof makes the rooms of the second floor rather warm in the summer. I very largely overcome this by using a concrete tile for the roof. This type of roofing I have used quite extensively and like it very much. The dead air space between the tile and the tight sub-roof, which is covered with Neponset paper, makes it something on the principle of a refrigerator. The roof if correctly laid is fireproof and is sure to last as long as the building stands, while at the same time it does not have the heavy effect that the ordinary clay tile possesses."



VIEW IN LIVING ROOM ON FIRST FLOOR, LOOKING TOWARD THE OPEN FIRE PLACE AND SHOWING THE CASED OPENING TO THE DINING ROOM ON THE LEFT

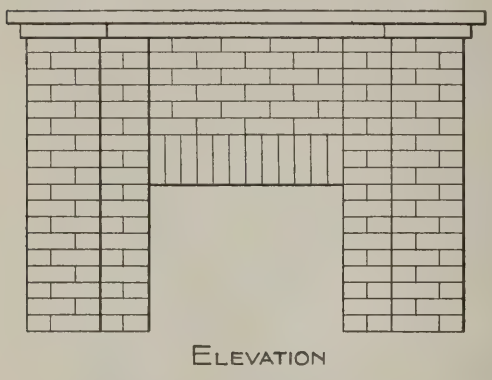
The dwelling here shown is located at the corner of Grant and Vilas Streets in Madison, Wis., overlooking Vilas Park, the largest and most beautiful of which Madison can boast.

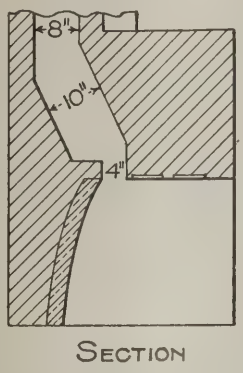
The building occupies a lot 60 x 120 ft. in plan and is in the midst of a colony of bungalows, all of which are of attractive and effective design. Tapestry brick of selected colors was used as a veneer for the foundation walls above grade, also

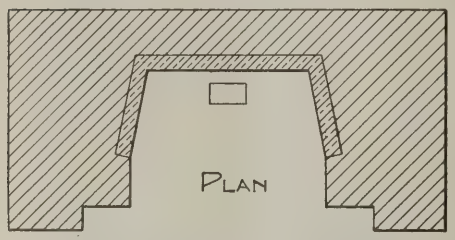
on the chimney and the porch columns. The panel effect in the gables serves to break up the otherwise plain surface and also has a tendency to add an attractiveness and coziness to the second-story windows.

The roof is covered with concrete tile made by the Madison Concrete Tile & Roofing Company. The designer states that this type of roof is what he has been seeking for a number of years "as it supplies practically an everlasting fireproof roof at a moderate cost." As already stated, the dead-air space between the tile and Neponset paper serves as an insulator against both heat and cold, which has always been a great problem with the low pitch roofs of most of the bungalows which the designer has constructed. The porch floor is of cement heavily reinforced.

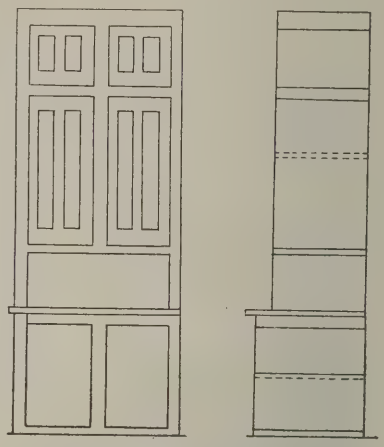
The first floor rooms are reached through a recessed opening with lights each side of the door. The living room, which is a feature of the house, extends the entire width and has at one side an open fireplace and at the other a bay or recessed window. The massive fireplace has seats on either



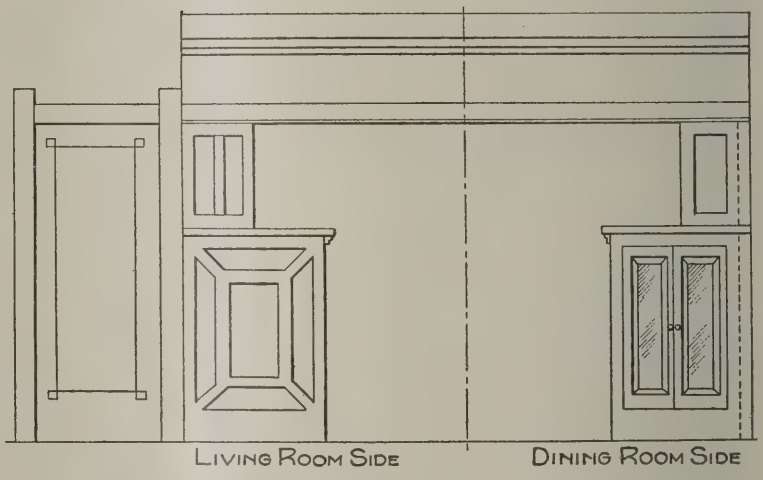




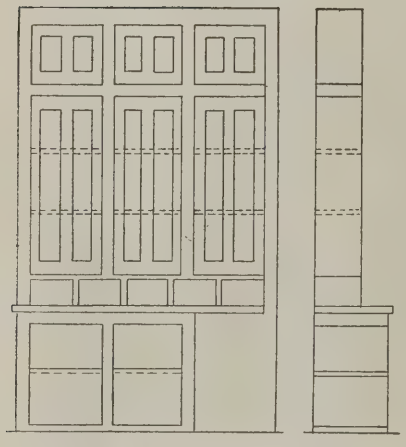
Details of Fireplace Construction



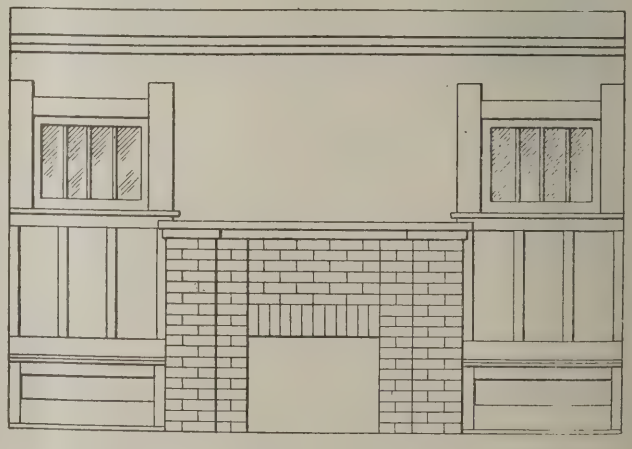
Elevation and Section of Kitchen Cupboard on Main Floor



Elevation of Opening Between Living and Dining Rooms



Elevation and Section of Kitchen Cupboard Common to Both the First and the Second Floors



Elevation of Fireplace End of Living Room

side of it and the alcove window or extension is also provided with seats.

Communication between the living room and the dining room is by means of an arched opening. The doors, which are of oak, have an ebony inlay border which gives a very rich effect. Below the chair rail the wall is covered with oak filmwood and is finished the same as the other oak woodwork.

China cabinets with bevel plate glass doors on the dining room side of the opening are provided. The electroliers are of solid oak according to the designer's plan. He states that in his experience he has found it advisable to design the electroliers and then have them made at the mill. In the West he points out one can secure a multitude of designs in wood electroliers at small cost, but that he has been unable since going to Wisconsin to find any place where he could purchase that particular type except at an unusual price and then they often would not fit into the open beams.

Beyond the dining room is the kitchen, equipped with cupboard, sink, etc., the sink being placed under a rear window where ample light is provided. The refrigerator is so placed as to be readily reached from the rear door and at the same time handy for the housewife in the kitchen. The only criticism which one might make to the position of the refrigerator is its proximity to the cooking stove.

The stairs to the cellar descend directly from the kitchen, while the flight leading to the second story are conveniently placed as regards the rear entrance.

The main sleeping room on the first floor opens directly from the living room, while beyond is a short hall which communicates both with the bedroom and also with the dining room and from it opens the bath room and linen closet.

In the bath rooms are instantaneous gas heaters, while in the basement is a Vail & Kyme pressure pump and tank.

The provision for the family on the second floor consists of a living room, dining room, kitchen, two sleeping rooms, a bath room and ample store room. The entire arrangement is clearly indicated by means of the second floor plan which is presented on another page.



THE DINING ROOM WITH VIEW OF LIVING ROOM BEYOND IN THE HOME OF EDGAR W. SMITH, MADISON, WIS.

The method of heating was first intended to be by hot air, but this plan was abandoned and a vacuum system installed which the designer states has given good service throughout.

The bungalow was ereced for Edgar W. Smith and was designed by E. C. Smith with offices in the Washington Building, Madison, Wis. He states that the original contract price was $5,500, but $600 was added to this figure on account of

changes from the original plan. This figure, it must be remembered, however, was made before war prices were in vogue and probably could not be duplicated at the present time.

The general contractor was Thomas Lofthus; the mason work was done by L. Parr; the heating contract was executed by Sumner & Toussiant; the plumbing work was done by Walter Hyland, and the painting by C. Nelson, all of Madison, Wis.

WAGES IN THE BUILDING TRADES IN BOSTON, MASS.

In the Monthly Letter prepared by Secretary William H. Sayward of the Master Builders' Association of Boston there is a table giving the present rate of wages in the building trades in that city and the advances demanded up to the first of June. These figures are of more or less interest to readers in the eastern section of the country and we therefore present them herewith:

Bricklayers	$0.70	
Carpenters	.60	— .65 after June 1, 1917.
Cement finishers	.62½	— asking .70 June 1, 1917.
Electricians	.65	— asking .75 June 1, 1917.
Elevator Constructors	.62	
Gas fitters	.60	
Hod carriers	.40	— asking .42 June 1, 1917.
Hoisting engineers	.75	
Laborers	.37½	— asking .40 June 1, 1917.
Lathers	.65	— striking for .75.
Marble cutters	.68¾	
Marble setters	.68¾	
Masons	.70	
Ornamental iron	.68¾	
Painters	.60½	— .62½ since May 1, 1917.
Pipe coverers	.50	
Plasterers	.70	— asking .80 June 1, 1918.
Plasterers (tenders)	.45	— .50 June 1, 1917.
Plumbers	.68¾	
Roofers	.55	
Sheet metal workers	.60	
Steam fitters	.62½	
Steam fitters' helpers	.34⅜	
Stone cutters	.70	
Structural iron	.68¾	
Tile setters	.75	

FINAL FIGURES OF CEMENT PRODUCTION IN 1916

Complete statistics covering the Portland cement industry in 1916 show that the production, 91,521,198 bbl., was second only to that of the record year 1913, when 92,097,131 bbl. were manufactured. The shipments in 1916 were 94,592,296 bbl., valued at $100,014,882—a new record of valuation.
valuation.

Higher prices for cement prevailed throughout the United States in 1916, except at a few places where top prices were realized in 1915. The average factory price per barrel in bulk at mills was $1.058, compared with $0.860 in 1915, an increase of 19.8 cents, or 23 per cent.

The combined production of natural and puzzolan cements in 1916 was 842,137 bbl., valued at $430,874, compared with 793,541 bbl., valued at $398,428, in 1915.

These statistics, compiled by Ernest F. Burchard, of the U. S. Geological Survey, Department of the Interior, are based on returns from every active plant in the United States and differ from the estimated figures, published earlier in the year, by only .04 to 0.4 per cent.

PAINTING A DAMP PLASTERED WALL

In writing for information to an authority on this subject, a Canadian painter stated that he had a wall in an office building which was to be painted. The wall is of brick and the plaster is applied directly on the brick, while on the other side is a vault. Moisture comes right through the plaster and he says he has tried almost everything, such as painting with a sharp color, also aluminum paint and shellac varnish, but the plaster appears soft and permits moisture to percolate through. The building is close to the water and more or less subjected to dampness. One suggestion which occurred to him was to batten the wall with canvas, but he does not think a good job can be made in this way. He therefore asked the opinion of the *Painters Magazine* as to a remedy.

The authority in question in replying to the above said: "We have a formula for a damp-resisting paint from an experienced master painter as follows: Prepare a mixture, in a small barrel or tub, of fifty pounds air-slaked lime, ten pounds glucose, two and one-half pounds alum (powdered), fifteen pounds boiled linseed oil, five pounds oil of eucalyptus and 68 pounds warm water, adding these ingredients gradually in this rotation, stirring until all is dissolved. If the material is too stout to work freely under the brush, add more warm water. With this, coat both sides of the wall, and when one coat has become dry, apply another, and if needed, a third one. You can add to this liquid any lime-proof pigment, such as zinc white or lithopone, Venetian red or yellow ocher, four pounds of any one of these being sufficient to one gallon of the liquid mixture.

"If this does not stop the dampness, the only remedy will be to remove the plaster, coat the brickwork with paraffine varnish and then plaster over this. Canvas battening is not practical in your case, nor would layers of tinfoil arrest the dampness."

Wentworth Institute, Boston, Mass., has placed its entire plant at the disposal of the War Department so that technical training in military engineering may be facilitated for enlisted men. A course of construction is being given that will continue throughout the summer and probably into the fall months. The concrete laboratory at Wentworth Institute was fitted up in co-operation with the Portland Cement Association and is being used to teach engineers the essentials of concrete work as particularly applicable to military operations, such as the building of gun foundations, bomb-proof construction, etc.

It is provided in the ordinance just adopted by the city of New London, Conn., that all walls, partitions and floors in schools, hospitals and places of public assemblage, over one story high, and all walls, partitions and floors in theatres shall hereafter be built of brick, stone, hollow or solid blocks or metal lath and Portland cement plaster on metal studding or other incombustible construction.

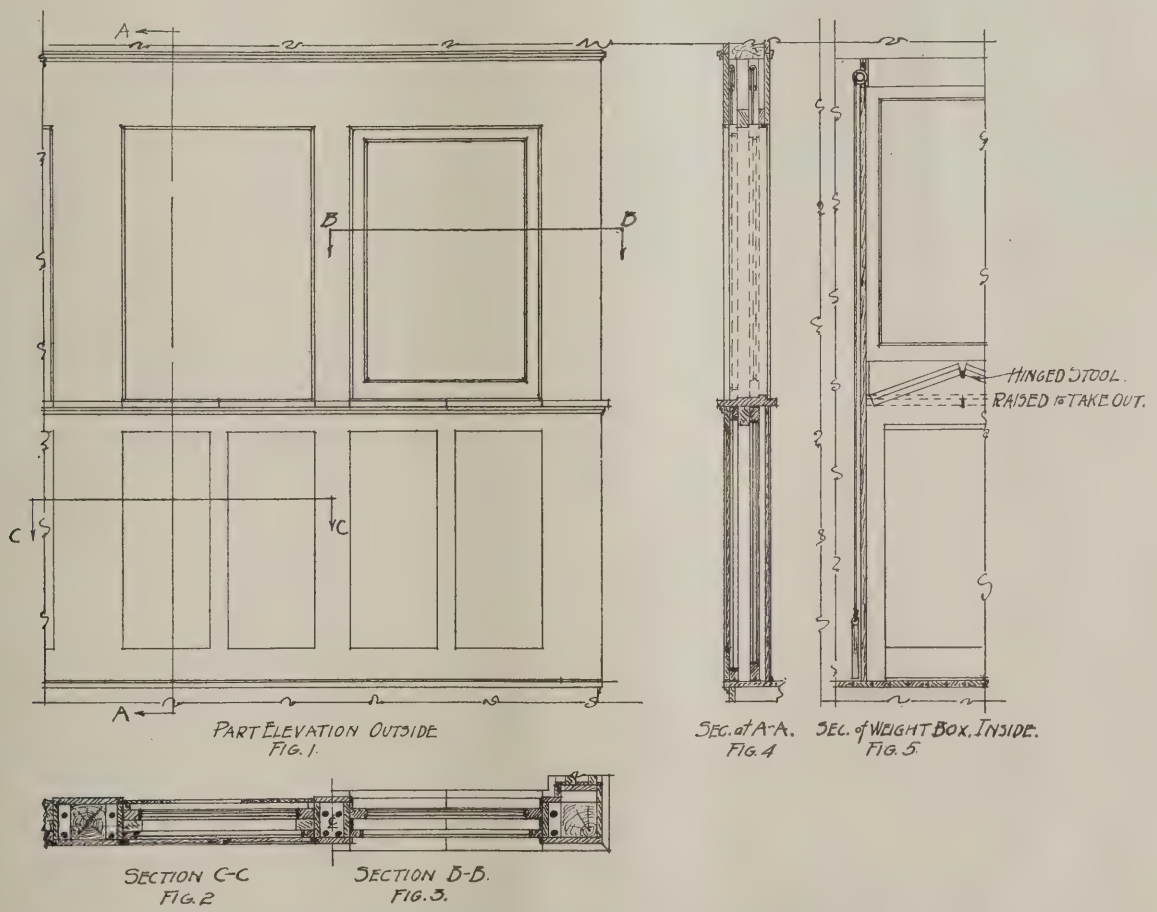
HOW TO CONSTRUCT A SLEEPING PORCH

SHOWING HOW A SECOND STORY OPEN PORCH MAY BE UTILIZED TO GOOD ADVANTAGE

BY JOHN WAVREK, JR.

THERE are various schemes of building a sleeping porch, some of which have good features and others features which are not so good. The most vital point to be taken into consideration in converting a regular open porch into an open and closed sleeping porch is that it should be so constructed that wind, rain and flies can be kept out, and this, of course, is not a very easy problem. to the accompanying sketches. Those readers who do not understand drawings so well may be aided by means of the description which is here presented.

Referring to the sketches, Fig. 1 shows the outside elevation of a portion of a second floor rear porch converted into a sleeping porch or cozy sun parlor. The railings have been removed and the various members which have been made ready by



VARIOUS DETAILS SHOWING HOW TO CONVERT A SECOND STORY OPEN PORCH INTO A SLEEPING PORCH OR SUN PARLOR

I have given the matter considerable thought and believe that I have devised a scheme by which all of these requirements have been met by providing both sash and screens which can be raised and lowered into a pocket and either one of which can be used separately or together as may be desired. The manner of construction is such that all of the annoyances mentioned are adequately guarded against, as a mechanic will readily understand by reference the planing mill have been put into place. Jambs containing weight pulleys are placed upright at a sufficient distance from the posts to allow free play for the weights, which balance both the sash and the screens. The pockets which are to contain the sash and screen are constructed as shown in the sketches, Figs. 2, 3, 4 and 5.

First a frame is made up of 2 x 3 in. stock, surfaced and comparatively straight. This frame is

without bottom rail in order that there be no obstruction to the outflow of water which might in stormy weather penetrate into the pocket. This frame also serves as a guide for the sliding sash and screen. The outside of the pockets is enclosed by panel work, which is likewise raised about ⅜ in. from the floor for the same reason as the 2 x 3 in. frame. Finally the lower part is completed on the inside by enclosing with ⅝ in. V-beaded staving or plaster as may be desired. This is constructed in such a manner as to keep out the cold if desired to use the porch as a sun parlor.

Fig. 5 shows the manner of hanging the sash and screen by balance weights. It also shows the scheme of removing the stool, which is cut across in the center and kept together by means of a hinge. If it is found desirable to lower the sash or screen into the pocket, it is first shoved up into the head pocket, when the stool may be easily removed, as shown in the sketch. After the stool is removed either member may be shoved down into the pocket. The stool is replaced and the other member is pulled down into place on the stool, as shown by the dotted lines in Fig. 4.

It will be noticed by referring to Fig. 4 that the stool or sill is provided with a rabbetted surface, which greatly aids in keeping out water. Section C-C in Fig. 2 shows sash and screen in the pocket. The section B-B in Fig. 3 shows both raised into position above the sill. The elevation in Fig. 1 shows how the scheme appears in either case.

It is hoped that the foregoing description will with the sketches make clear how a comparatively useless open porch on the second floor of a house may be converted into a sleeping place or sun parlor.

FINED FOR MAKING BUILDINGS TOO ORNAMENTAL

As showing some of the economies urged by the authorities in England at the present time, we learn that fines amounting to an equivalent in United States money of $100, $150 and $250 were recently imposed on builders and owners of property in one of the suburbs of London for a too lavish use of labor and materials in decorating a house. The proceedings, it may be interesting to state, were taken by the Ministry of Munitions under the Defense of the Realm Act.

SKYSCRAPER WITH MANY NOVEL FEATURES

One of the most unique co-operative apartment houses of which New York City could boast for many years past has been projected for erection on Park Avenue, extending from Fifty-first to Fifty-second Street. It will embody features that have grown largely from the regulations of the new building code and the necessity for a solution of the servant and living problems, which, it may be remarked parenthetically, are more acute than ever. The plans which have been prepared by Architects Starrett & Van Vleck call for a structure nineteen stories high and containing duplex apartments ranging from twenty-two rooms or more down to two rooms with bath and pantry.

Above the 150-ft. building line the structure is to terrace back 15 ft. at every two stories, so that the occupants of the duplex apartments above the 150-ft. line will have gardens, pergolas, loggias and out-of-door sleeping porches, which will belong to them exclusively.

The building will not only be an apartment house but a private dwelling and hotel combined, containing all the features which have made the *Hotel des Artistes* in West Sixty-seventh street—the artist builders' last operation—one of the most successful buildings of the year. There will be a hotel dining room, a ballroom, palm garden, swimming pools, squash courts, and other features for the pleasure, comfort and health of the tenants of the building.

What is unquestionably the distinctive feature is the double service in the matter of cooking. A great kitchen will extend around the rear part of the entire second floor and be connected with every apartment, large and small, by fast-moving electric dumbwaiters. The corporation which will run the hotel and the building will be subsidized by a fixed annual stipend to cook for all the occupants of the building. The tenants may use this service or their own individual kitchens, or both, according to preference. The plan is intended to simplify the servant problem, making it possible to have an elaborate apartment and at the same time be independent of the aggravating servant problem. Another feature will be the service bureau, in charge of a competent matron, where servants in proper livery may be hired by the hour for any purpose. At the very top of the building there will be accommodations for forty specialized servants of this type.

The total cost of the building and the land upon which it will rest is estimated at about $3,600,000. People may buy their apartments in the co-operative structure from $15,000 up to $120,000, according to size and location.

GLAZING WITHOUT PUTTY

Glass panes can be held in place without putty by the use of a flexible metal or rubber strip like a partly open tube laid upon the pane and held down by a set of clamps spaced along the pane, says a writer in *Building World*. First apply the pane of glass so as to fit it into the usual recess, then lay the prepared metal or spring strip along one side and screw on a plate at the corners of the pane and say one at the middle, these being flat plates with a somewhat incurved edge where they take hold of the spring strip, and are screwed on the woodwork at the side of the pane with the curved ends projecting out and over the pane so as to inclose the strip. The latter are, of course, put on at all four sides of the pane.

A double pane with air space between can be applied by using a deep recess and just laying a pane, then the strip, next a second pane and finally a strip that now comes flush with the woodwork and can be fastened down by the metal plate as before.

TWO VERY NECESSARY FARM BUILDINGS

ONE OF THESE IS THE CORN CRIB AND THE OTHER THE PIGGERY—VARIOUS DETAILS

BY W. E. FRUDDEN

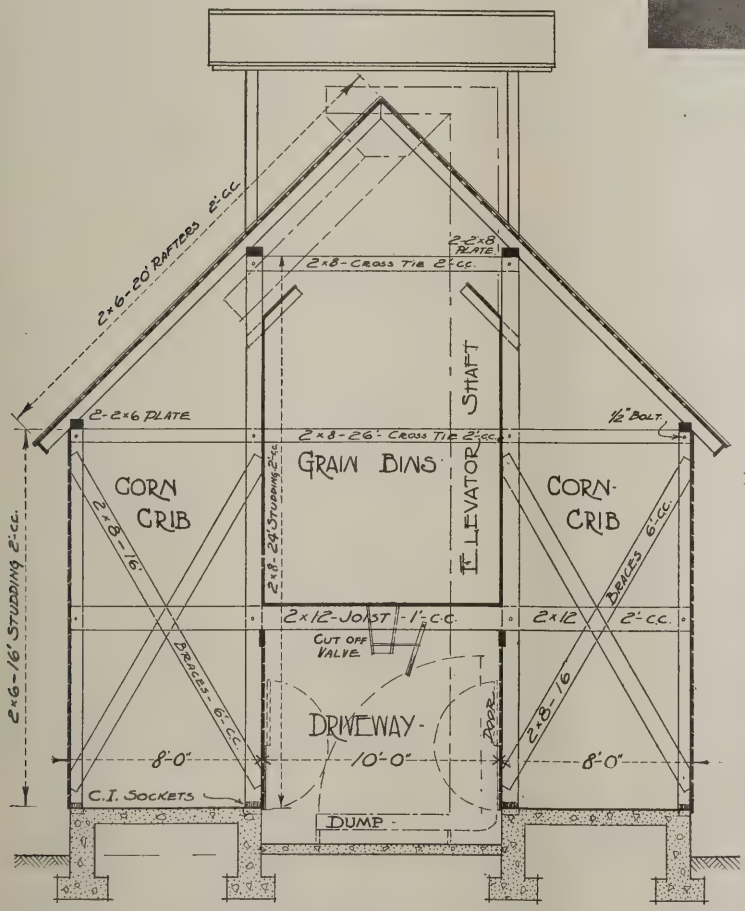
IN view of the present wild flight of prices of corn to heights unheard of before in the history of the country, attention is naturally focused in large degree upon this food-producing article, and speculation is rife as to the prospects for adequate supplies the ensuing season. No one can tell at this writing what these will be, but in any event provision must be made for properly housing the harvest, and the illustrations here given of a high corn crib and granary may prove of suggestive value to builders in the agricultural sections. It is generally recognized among those well informed on the subject that the style of corn crib mentioned, equipped with proper elevating machinery, is not only labor-saving but is also more economical in construction than the commoner types.

The foundation, floor, and the roof costs are practically the same as in the low structure while the capacity is more than doubled at the expense of merely extending the studding from 8 ft. or 10 ft. to 16 ft. and a small amount of additional bracing. The labor-saving factor, however, in the high crib is perhaps the most important.

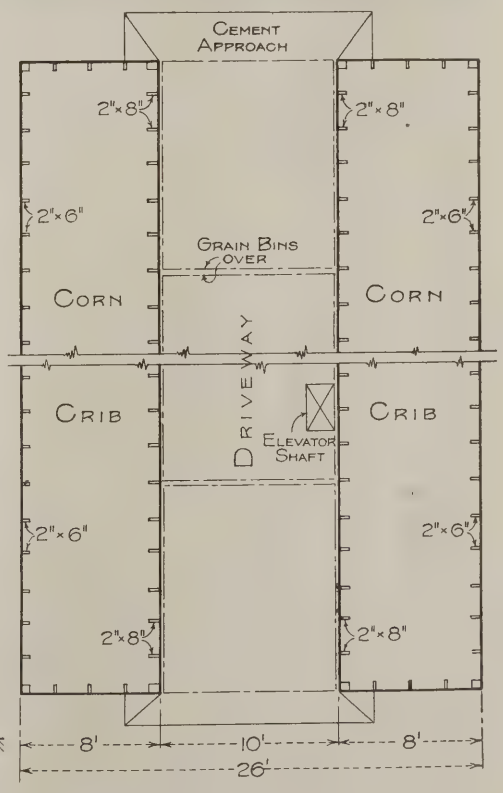
The picture shows a typical structure of this na-



A Modern Corn Crib and Granary



Vertical Cross Section of Corn Crib and Granary—Scale ⅛ In. to the Foot



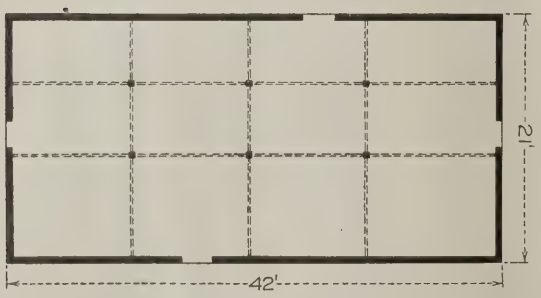
Floor Plan—Scale 3/32 In. to the Foot

ture. Various kinds of elevators may be installed, an inside cup elevator of any style or a portable elevator being used to advantage. Neither corn nor small grain will need shoveling when filling or emptying the cribs or bins. The wagonload of corn or grain is dumped into the pit, then hoisted to the cupola at the top of the building and distributed to any one of the cribs or bins as desired. Power is supplied for the elevating machinery by a gasoline engine located in the engine room, or by tread power, as may be preferred. The grain bins above the center driveway are emptied by opening the cut-off valves in the floor, and the grain rushes down the spouts directly into the wagon below.

Corn is removed in either of two ways from the side cribs. If shelling is practised, the conveyor belt or the drag of the sheller is made to run along the sides of the driveway and the small doors opened to allow the corn to roll down into the drag belt and be carried out to the machine for shelling.



Front Elevation of Sunlight Hog House



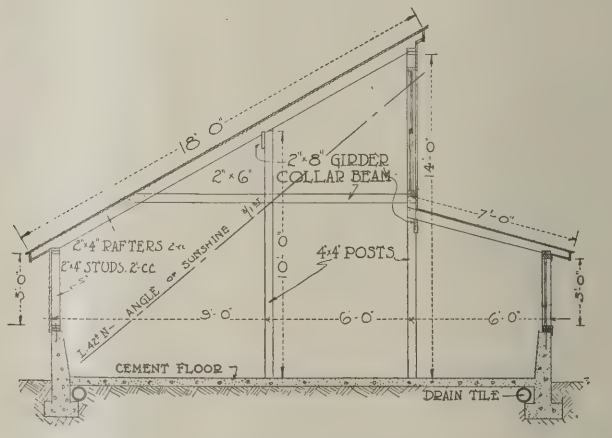
Floor Plan Showing Location of Removable Pen Partitions

A trench may be built in the center of the floor and covered with short lengths of plank, which will be removed and the corn allowed to fall down in the conveyor, which is made to run through the trench, which is about 20 in. wide and 20 in. deep, extending the full length of the crib floor. Shelled corn may be hoisted to the bins above the driveway with the elevator.

The cross section and plan relate to a standard type and a common size of crib for farm use. It may be built in any length. The width is 26 ft. The cribs are 8 ft. wide and the driveway and the bins above are 10 ft. The outside wall studding are 16 ft. This is a strong and durable crib and granary designed to carry maximum loads. The studding are 6 x 8 in., placed 2 ft. center to center, and braced with 2 x 8's and 2 x 12's, in a manner that has been proved and has made good in actual practice in many cases in Iowa. The floors and the footings of concrete are made from a 1:3:5 mixture of cement, sand and gravel, and are run up 20 in. above the grade line. The studs are anchored to the concrete by means of cast-iron sockets. The outside upright wall studding are 6 in., with a double plate at the top. The inside studs are 2 x 8 in., and are 24 ft. long, running way up to the purlin plate, which consists of two 2 x 8's spiked together.

There are two series of cross ties. At the top of the outside wall studs are 8-in. planks that reach entirely across the building from one wall to the other, or 26 ft. These are bolted to each stud, and the same thing is done for the top of the grain bins, with a 2 x 8-in. cross tie. The grain bin floor joists are 12 in., and are 1 ft. apart. Every other one is run entirely across the building from one outside crib wall to the other and bolted securely. The bin floor joists rest on a 2 x 6-in. ribbon plate which is notched 1 in. into the studs. Every 6 ft. the corn cribs are braced with criss-cross braces spiked firmly to the wall studding. The roof rafters are 2 x 6 in., placed at half pitch and 2 ft. center to center, well spiked to the plates. The framing of the cupola and its size will depend upon the size and the kind of elevator used.

A "Bill of Materials" for any length crib that



Vertical Cross Section of the Hog House Showing Dimensions of the Framing Timbers

is 26 ft. wide can be obtained from the following list. The cost can be estimated on the basis of local prices. The list which follows is for a 12-ft. section of a 26-ft. wide crib. Multiply the amounts given by the number of times that 12 is contained in the desired length.

The ear-corn capacity for the 12-ft. section will be 1400 bushels, and in the grain bins over the driveway 1250 bushels of oats or wheat or shelled corn can be stored.

Materials Required for a 12-Foot Section of a 26-Foot Crib

Floors and Footings

12 yards concrete 1:3:5
13 barrels cement
7 yards clean sand
12 yards gravel
12 cast iron sockets for 2 x 6
12 cast iron sockets for 2 x 8

Framework

12 pieces 2 x 6 16 ft. studs outside
12 pieces 2 x 8 24 ft. studs inside
12 pieces 2 x 6 20 ft. rafters
4 pieces 2 x 6 12 ft. plates
4 pieces 2 x 8 12 ft. plates
6 pieces 2 x 12 26 ft. cross ties and joists
6 pieces 2 x 12 12 ft. bin floor joists
2 pieces 2 x 6 12 ft. ribbon plate
6 pieces 2 x 8 26 ft. cross ties.
6 pieces 2 x 8 12 ft. cross ties.
8 pieces 2 x 8 16 ft. criss-cross braces
1904 ft. dimension lumber

Covering

500 ft. 5 in. bevel edge siding
200 ft. 5 in. sq. edge crib siding
700 ft. 8 in. ship lap (bins)
500 ft. 6 in. roof sheathing
4320 cedar shingles 16 in.

Materials Required for the Two Ends of the 26-Foot Crib

Framework

8 cast iron studding sockets 4 x 6
6 cast iron studding sockets 2 x 6
24 pieces 2 x 6 16 ft. studding
4 pieces 2 x 6 20 ft. rafters
6 pieces 2 x 8 26 ft. plates and ties
6 pieces 2 x 8 12 ft. plates and ties
2 pieces 2 x 12 26 ft. joist and ties
4 pieces 2 x 6 16 ft. wind braces
8 pieces 2 x 8 16 ft. criss-cross braces
1100 ft. dimension lumber

Covering

700 ft. 5 in. bevel edge crib siding
600 ft. 5 in. square edge crib siding
300 ft. 6 in. flooring for doors
300 ft. 4 and 12 in. cornice lumber
3 windows 8 lt., 8 x 10

The 16-ft. high crib and granary is commonly built in the Middle Western States. The cribs on both sides of the driveway are 8 ft. wide and run up to the roof. The driveway is 10 ft. wide and the ceiling is 9 ft. in the clear in most cases, or this is made to suit the elevator used. The following are the capacities for different lengths:

Length	Ear Corn Capacity	Small Grain Capacity
28 ft.	2866 bushels	2375 bushels
32 ft.	3276 bushels	2743 bushels
36 ft.	3686 bushels	3111 bushels
42 ft.	4300 bushels	3663 bushels
48 ft.	4914 bushels	4215 bushels
54 ft.	5828 bushels	4767 bushels
60 ft.	6144 bushels	5319 bushels

Closely associated with the question of corn supply is the raising of hogs and the housing accommodations to be provided for them in order to secure the best possible results in the way of pork.

The sunlight hog house is regarded as the typical structure for the purpose, and the one here illustrated will afford the reader an idea of its various details. The south front walls in this 21 by 42-ft. piggery are mostly glass, as all modern hog houses should be. It is a frame structure, with a concrete base, built up so that all the wood parts are free from soil moisture.

The following Bill of Materials will be found of value in this connection:

15 barrels cement
20 pieces 2 x 4—16-ft. plates and sills
20 pieces 2 x 4—10-ft. sills
8 pieces 4 x 4—10-ft. center posts
8 pieces 4 x 4—14-ft. center posts
15 pieces 2 x 4—10 ft. studding
45 pieces 2 x 4— 3 ft. studding
22 pieces 2 x 4—18-ft. rafters
22 pieces 2 x 4— 7-ft. rafters
8 pieces 2 x 6—12-ft. collar beams
4 pieces 2 x 8—16-ft. girders
2 pieces 2 x 8—10-ft. girders
700 ft. 6-in.drop siding
1350 ft. shiplap sheathing
11 squares 3-ply roofing
8 sash, 4 lts., 10 x 12
9 windows, 8 lts., 10 x 12
300 ft. finished lumber

Referring to the floor plan, the dotted lines indicate the location of removable pen partitions.

The picture shows the completed hog house, while the cross-section through the building gives the sizes of the timbers to use in each place. For March first litters in the heart of the corn belt this house is especially designed to make the best use of the sun's rays during farrowing time.

SCHOOL ARCHITECTURE IN 1916

School architecture as an art did not make such marked progress during 1916 that the year stands out in sharp contrast to any preceding year, says the *School Board Journal.* Several movements have, however, matured during the year to greatly advance the science of schoolhouse planning. Chief among these is the work of the co-operative committees for standardizing the essential elements of schoolhouse planning and construction. While individual and sporadic efforts had been made in former years to set schoolhouse standards with more or less accuracy, the year 1916 has seen the leading technical, architectural and educational organizations unite co-operatively for formulating a basis to judge the efficiency of schoolhouse plans and to determine such principles of design and construction as are to be of lasting value.

Reports on a great number of high school buildings undertaken during the year 1916, reveal a general trend for planning in the direction of greater utility and wider use for every classroom, laboratory, etc. The buildings have generally shown a closer adherence to the introduction of small study halls, which may be used at the same time for recitation purposes and which will obviate the necessity of duplicating one-quarter or one-half of the seating capacity of buildings.

In elementary school buildings there has been a wide acceptance of the one-story plan which seems to have impressed school boards, particularly in small communities, with its superior advantages for safety against fire, for flexibility in enlargement and for wider use as a social center. The one-story school has not, however, demonstrated its economy in the matter of first cost or subsequent upkeep.

Rural school architecture shows an appreciable improvement through a number of preliminary movements designed to improve country schools. During the year 1916 the number of consolidated schools throughout the country increased by nearly one-fifth. The plan adopted in the great agricultural states of the Middle West for standardizing rural schools, has had a wonderful effect in improving the architecture of the buildings and in causing the remodeling of literally thousands of old school houses which were defective in lighting and ventilation.

The city and county of Grand Forks, N. D., is said to be experiencing one of the greatest building booms in its history.

A MODIFIED COLONIAL FRAME DWELLING

SOME INTERESTING CONSTRUCTIVE DETAILS RELATING TO THE DWELLING SHOWN ON THE FRONT COVER

THE subject of our colored cover design this month is a frame dwelling of modified colonial architecture and providing eight rooms and bath. It embodies many interesting features likely to command the attention of architects and builders, the details of construction presented herewith being of special value to the latter. Among the noticeable features are the chimneys built of field stone and laid up in white cement mortar with struck joints. They are finished off with bluestone caps 5 in. thick and topped with round flue tile projecting 10 in. above the cap stone, all as shown in the elevations.

LAYOUT OF ROOMS

Reference to the floor plans shows a large living room at one end of the house and extending the full depth of it. French windows open on to a side porch which may be used as a sun parlor whenever so desired. The entrance to the house is through a vestibule located in the center of the front and opening directly into the main hall from which rises the flight of stairs to the second story. These are of what is known as the "return type" and are lighted from the window at the rear in the second story, while at the same time they gain some light through the windows in the front of the house on the main floor.

At the left of the hall is a dining room 12½ ft. square and fitted with an open fireplace. Communication with the kitchen is established through a commodious pantry so placed as to shut off all odors from the kitchen. The pantry is provided with cupboards and closets and has a sink placed under the outside window so as to afford plenty of light. The stairs to the cellar descend from the pantry.

The mantels in the living room and in the dining room and also the mantel breast in the bed room are to be built of stone with joints neatly pointed. Arches are to be turned over all fireplace openings. Cast iron mantel dampers are to be inserted in the mantels in the living and dining room fireplaces.

In the rear of the main flight of stairs is a study 7½ x 8½ ft. and lighted by an outside window.

SECOND FLOOR ARRANGEMENT

On the second floor, the master's room located directly over the living room, extends the full depth of the house. Directly over the front hall is a sewing room and the space over the study is devoted to the second story hall from which the rooms on that floor are reached. The bathroom is located over the pantry and is in such a position as to concentrate the plumbing fixtures—an arrangement regarded as tending toward economy. Each bedroom is provided with a commodious clothes closet and there is a linen closet opening from the hall on this floor.

THE BATH ROOM

The bath room on the second floor is to be laid with white tile on a cinder-concrete bed with tile base and cove. The room is to be wainscoted 5 ft. high with cement and cove and then panelled off to imitate tile.

According to the specifications of the architect, the foundation walls are to be of field stone 20 in. thick and to start on footings of stone or concrete of not less than 10 in. thick and projecting at least 6 in. beyond the walls on both sides. All joints are to be pointed smooth where exposed. The cellar is to be 7 ft. 6 in. in the clear.

All framing members not otherwise specified are to be spruce or hemlock. The sills are to be 4 x 6 in. laid flat; the girders are to be 6 x 8 in. yellow pine; the first floor beams are to be 2 x 10 in. long leaf Southern pine placed 16 in. on centers; the second floor beams are to be of the same material 2 x 8 in. in size also placed 16 in. on centers while the rafters are to be 2 x 8 in. placed 20 in. on centers. The ridges are to be 1¼ x 10 in. in cross-section. The beams are to be doubled for all headers and trimmers around chimneys, etc., and are to be hung in stirrup irons.

THE EXTERIOR COVERING

All outside vertical walls are to be covered with ⅞ in. sheathing dressed on one side, and over this is to be placed one thickness of building paper well lapped. This in turn is to be covered with novelty siding nailed with heavy galvanized iron nails.

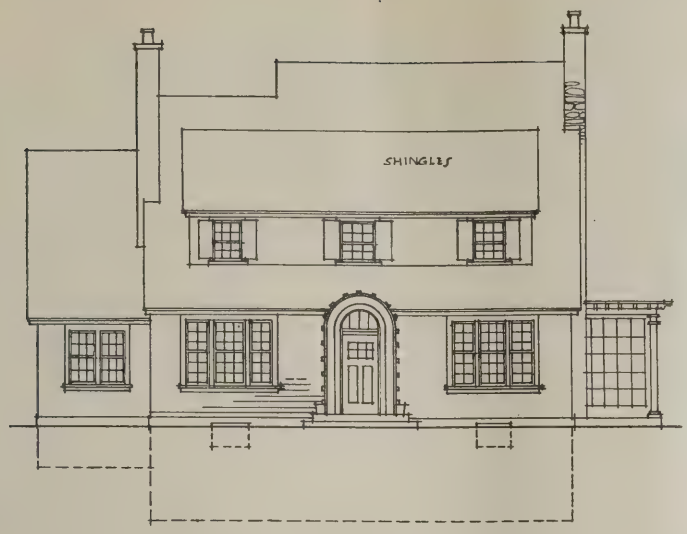
The roof is to be covered with shingles laid in regular courses and exposed 5½ in. to the weather.

The rooms of the first floor are to be double, the sub-floor to be of rough boards while the finish floor is to be of ⅞ x 2½ in. tongued and grooved maple. All flooring is to be blind nailed. The floors of the rooms in the second story are to be single.

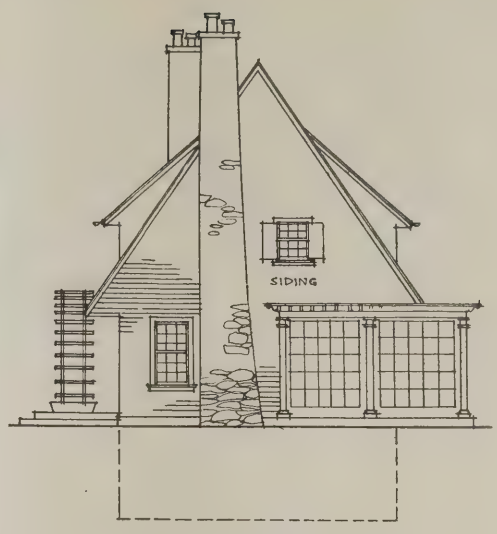
All interior trim, base, balustrade, etc., are to be of plain design with no moldings and to be of first quality white pine or cypress.

The main cornice is to be formed of plain fascia and simple cornice molding. The entrance trellis-hood is to be built up as shown in the drawings with flower boxes at the base. The porch is to be framed of white pine or cypress according to preference and the columns are to be of the built-up type and of plain design.

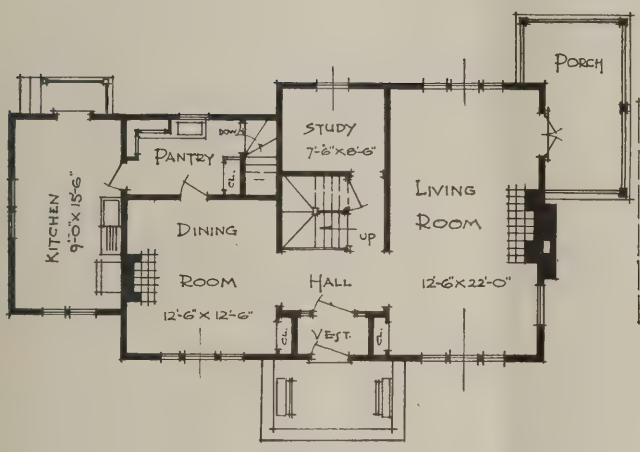
The walls of all the rooms are to be lathed and plastered with two coats scratch and brown coat work. All interior rooms are to have hard white



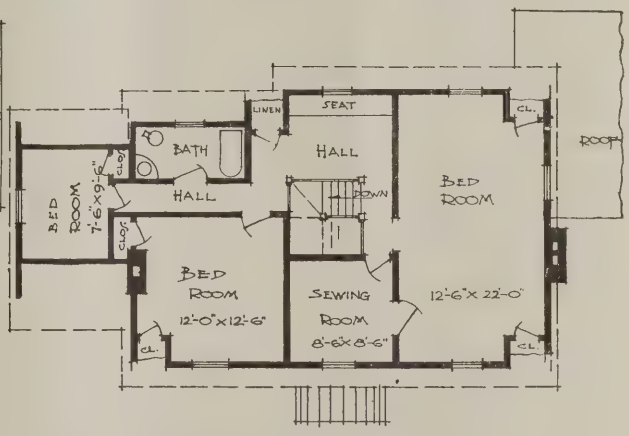
FRONT ELEVATION



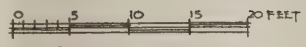
SIDE ELEVATION



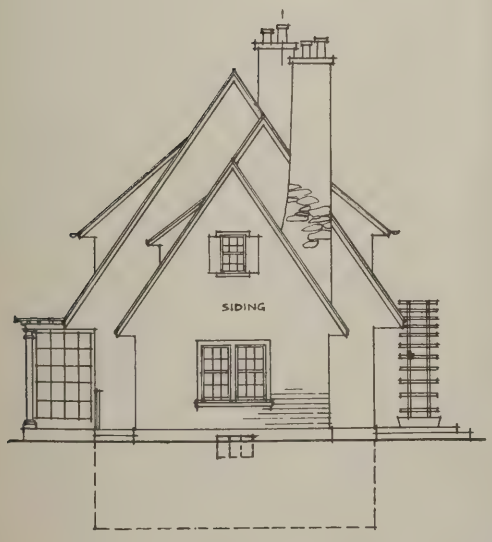
FIRST FLOOR PLAN



SECOND FLOOR PLAN



SCALE IN FEET



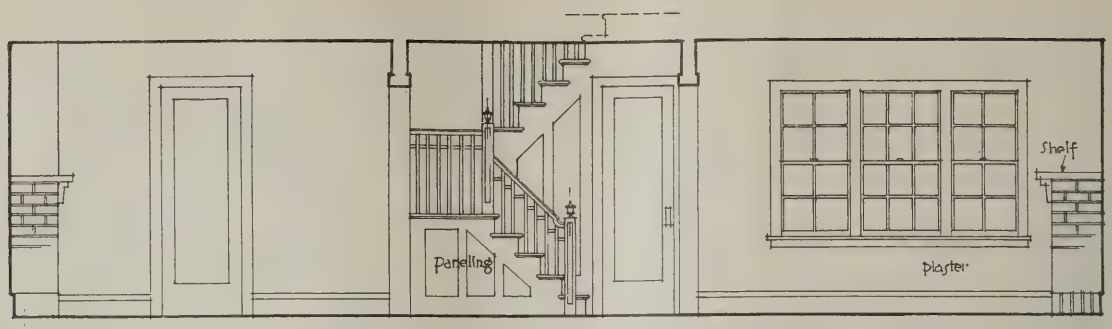
SIDE ELEVATION

FRANK T. FELLNER
ARCHITECT

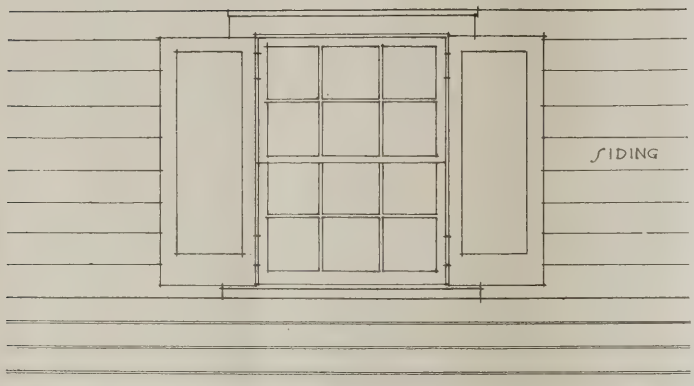


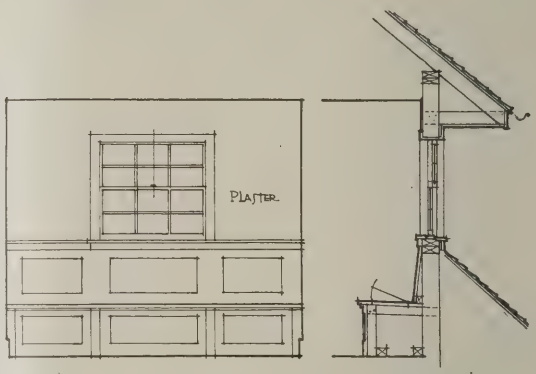
REAR ELEVATION

PLANS AND ELEVATIONS OF THE HOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE



ELEVATION OF DINING ROOM, HALL & LIVING ROOM



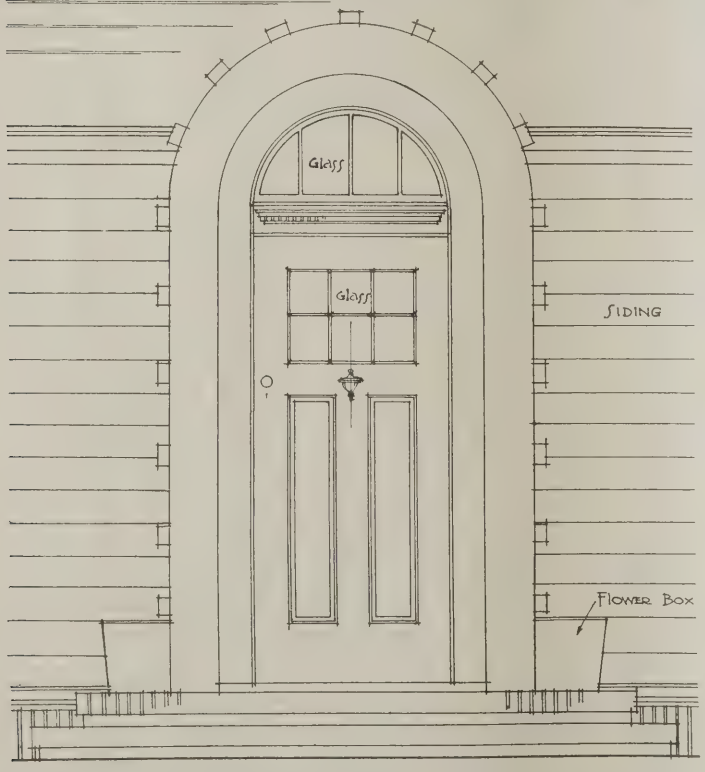


ELEVATION · SECTION ·

SECOND FLOOR HALL SEAT

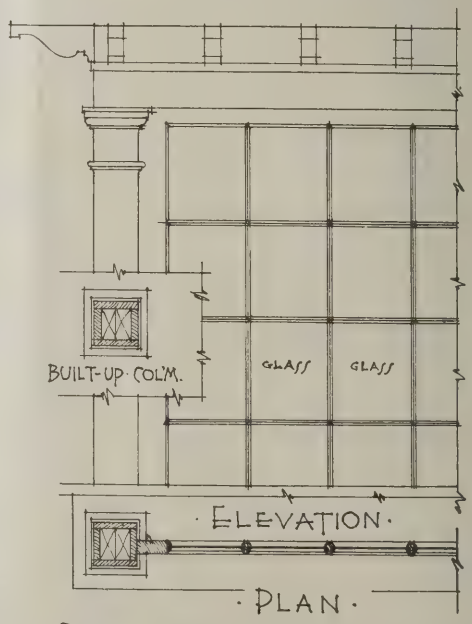


SCALE FOR DINING & LIVING ROOM; ALSO SEAT ELEVATIONS

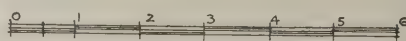


DETAILED ELEVATION OF ENTRANCE ETC

FRANK T. FELLNER - ARCHITECT.



DETAILS OF ENCLOSED PORCH



SCALE FOR DETAILS OF FRONT ENTRANCE AND ALSO FOR ENCLOSED PORCH . . .

MISCELLANEOUS DETAILS OF THE HOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE

finish including the closets, the kitchen, etc.

All tin used for flashings, etc., is to be painted both sides with metallic paint. The gutters and leaders are to be of galvanized iron, painted before setting. The leaders are to empty on the ground away from the house. The flashings around chimneys, etc., in order to make the roof tight, are to be of tin, step flashed into masonry at the roof where the chimneys emerge.

All outside wood and metal surfaces except shingles are to receive three coats of paint. The roof shingles are to be dipped in stain before laying, if wooden shingles are used.

All inside standing woodwork on the first and second floors is to receive three coats of paint.

The house is to be heated by a hot water system, the exposed pipes in the cellar to be covered with asbestos packing. All rooms and the hall with the exception of the pantry and the kitchen are to have radiators located where possible under the windows or at least near them. This system includes a heater with sufficient capacity to maintain a comfortable temperature throughout the house of 70 deg. Fahr. during zero weather. All necessary appurtenances to the heater and entire system are to be supplied. The cellar walls are to be pointed up on exposed stone surfaces and whitewashed.

The entire building is to be piped for gas and wired with a flexible tubing system for electricity. The fixtures are to be of the combination type and of neat pattern. The dining room and living room fixtures are to be drop pendants and wall brackets are to be provided in the bedrooms—all of neat but modern design.

In regard to the plumbing, extra heavy cast iron pipe is to be used. The building is to be properly lined for house soil and vent system. The building is to drain to the street sewer or cesspool in the rear if no sewer is provided in the street.

All fixtures are to be porcelain enameled iron and of modern design, and the fittings are to be nickel-plated. A two-part wash tray is to be furnished for the laundry in the cellar and a water heater is also to be provided. The main supply pipe is to be of 1 in. diameter and the branch lines ⅝ in.

The hardware is to be of plain design and black iron finish. All locks, bolts, hinges, etc., are to be properly fitted in a workmanlike manner and all necessary constructive hardware is to be supplied complete.

The architect estimates the approximate cubical content of the house shown on the front cover to be 25,960 cu. ft. on which he places a unit price of 24c. per cubic foot. This estimate is based on prices which would prevail in moderate sized towns and suburban developments throughout the country, using average unit cost price, but the figures do not include the customary contractor's profit. The architect allows $950 for masonry, concrete and cement; $275 for plastering; $2750 for carpentry and mill work; $365 for the plumbing; $480 for heating; $340 for painting; $210 for the metal work; $90 for the hardware; $85 for tile work, bath room, etc.; and $340 for gas and electric work.

The house shown on the front cover was designed by Frank T. Fellner, 413 Caton Avenue, Brooklyn, N. Y., or care of the BUILDING AGE, 243 West Thirty-ninth Street, New York City.

FIREPROOF PHOTO THEATER DESIGN*

THE EXITS AND THE STAIRS—ARRANGEMENT OF THE SEATS—HOT AIR REGISTERS

A THEATER located between other buildings should have an external passageway on each side extending from the proscenium wall line to the street line at the front of the theater. If the theater abuts on a street at both the front and rear, these passageways should extend the entire length of the building. The passageways should be not less than six feet wide throughout their entire length, and their sides should be parallel. It is also advisable to cover them over at a height of eight feet with brick or some other fireproof material. Stores, offices, and dwellings should be separated from the theater building by solid walls or partitions constructed of fireproof material, and their entrances and exits should be entirely separate and distinct from those of the theater.

Sidewalks and passageways leading from exits to main thoroughfares should be smooth, unobstructed and well illuminated. The passageways are often partially obstructed by boxes, barrels, etc., but this practice should not be tolerated.

The risers of stairs leading from the main entrance to the main floor of the auditorium should be uniform in height. The height should not exceed 7¾ inches, and the treads should be at least 10½ inches wide. Wherever stairs lead downward from exits there should be a space of at least one foot between the door opening and the edge of the top step. Stairways that extend to court or street grades should be independent of one another.

All stairs should be provided with substantial hand-rails, and when the stairs are built between walls, the railings should be firmly secured to the walls, and should stand out about 3 inches from them. This also applies to the side aisles of balconies. Railings used on stairs should be about 3 feet above the treads. Stairs and landings between balconies and main floors, when 7 feet or more in width, should be provided with center rails of metal pipe, not less than 2 inches in diameter, placed about

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Continued from page 299, June issue.

three feet above the stair treads and securely fastened to them by flanges. Non-slipping stair treads of abrasive material are often used, and these, or others of an equally effective type, are recommended.

THE EXITS

If the total rise of the balcony, measured vertically, exceeds twelve feet, a tunnel or passageway should be provided for an exit, and this should lead directly to a corridor or to the lobby of the theater. The tunnel or passageway should not be less than four feet wide.

The slope of the floor should be sufficient to permit persons at the rear of the room to clearly see the stage or screen over the heads of those sitting in front, but it should not be unnecessarily steep. A grade of 10 per cent is sufficient to give a clear view from all parts of the auditorium, and when this standard is adopted it will be unnecessary to place steps in the aisles.

In boxes accommodating no more than 15 persons it is usually unnecessary to have the seats fastened to the floor. In the auditorium, and in all other parts of the theater, however, the seats should be firmly fixed to the floor by suitable castings, each secured by at least three screws. Loose seats should receive immediate attention. The distance between the rows (as measured from the back of one seat to the back of another) should be at least 32 in., and the width of each seat should be at least 18 in.

NUMBER OF SEATS IN A ROW

There should not be more than eleven seats in any one row, between aisles. If the aisles do not lead directly to an exit, cross aisles should be provided in the main auditorium dividing the seats into blocks containing not more than fifteen rows each, and in balconies a cross aisle should be provided to every nine rows of seats. The main aisles in the auditorium should be at least 32 in. wide at the front of the theater (or at the end nearest the screen), and from this point the width should be increased at the rate of ¼ inch per lineal foot until a width of 38 in. is attained. If there are seats on one side of the aisle only, the minimum width of aisle should be 28 in. at the front of the theater, and this width should be increased in same proportion as given above. The minimum width for aisles in other parts of the theater should be 28 in.

When it is necessary to place hot-air registers in the aisles of the auditorium, these should be made flush with the floor, and all screw fastenings should be countersunk. Steam or hot-water radiators, when placed along the side aisles, should be recessed into the walls, so as not to obstruct the passageways. Carpets and other floor coverings should be firmly fastened, special care being taken not to allow the edges to roll or turn up, and to repair torn or badly worn places promptly.

INDIRECT LIGHTING

The indirect system of lighting is well adapted for moving-picture theaters, as it gives a soft, diffused glow which can be nicely regulated. The light is produced by means of incandescent electric lamps, mounted in elevated fixtures that are closed at the bottom and entirely open at the top. The rays of light strike first upon the ceiling, from which they are reflected downward toward the audience. The effectiveness of this system varies according to the color and finish of the walls and ceilings. A glossy white finish will reflect the most light, but a slight creamy tint makes the illumination more pleasing to the eye.

There should be side-wall and ceiling lights along the side aisles, giving sufficient diffused light to enable the ushers to show persons to their seats during the display of a picture.

A red light should be located over each exit door, and this light should be kept burning continuously during the entire performance.

The electricity for lighting the theater and for operating the moving-picture equipment should be obtained, when possible, from two separate street mains. One service should be of sufficient capacity to supply current for the entire installation and its accessories, while the other supply should be sufficient for all emergency lights, including the exit lights and the lights in the corridors, lobbies, stairways, and other portions of the theater which are usually illuminated during the exhibition of pictures. In locations where only one supply can be had from the street mains, the emergency light circuit should be connected at a point on the street side of the main-service fuses, thus insuring adequate lighting at all times unless some trouble occurs outside of the theater.

When theaters have their own electrical generating plants, storage batteries should be provided, of sufficient capacity to operate the emergency lights in case of trouble with the generators. This method of lighting is often adopted in small towns where public electrical facilities are limited.

CONTROL OF HOUSE LIGHTS

The main service supply switches and fuses may be located in the operator's booth with advantage. The house lights can then be controlled by the operator of the moving-picture machine and can be lighted or turned off as conditions require. For occasional convenience, and for emergency use, an auxiliary switch box should be installed at some suitable point in the corridor or elsewhere. This box should be inclosed, and it should be constructed of incombustible material. The screws or bolts used for securing it in place should be countersunk, and effectively insulated.

The fuses should be of the inclosed type throughout the entire building, all the wiring and electrical apparatus should be insulated.

A building improvement to be carried out at the extreme lower end of Manhattan Island is a model tenement house which will be six stories in height and occupy a frontage of 63.6 ft. on Washington Street and 93.9 ft. on Morris Street, New York City. It has been designed by Architect B. B. Meyers, who estimates the cost in the neighborhood of $100,000.

THE FRAMING OF A "LAND" BATTLESHIP

BUILT TO STIMULATE NAVY RECRUITING — VARIOUS DETAILS OF CONSTRUCTION

ONE of the most notable examples of the various patriotic movements throughout the country which have been launched to stimulate a ringing response to the President's call for an adequate army and navy is that originated by the Union Square Recruiting Station which is a development of the Mayor's Committee of New York City on National Defense. As the United States Navy is not provided for in the selective draft, it was deemed advisable to evolve some scheme which would aid in bringing home to every New Yorker the responsibility toward the first line of defense which his citizenship entails, thus stimulating navy enlistment from this city to more fully meet the requirements of the nation.

As a result, the tall buildings fringing Union Square Park, New York City, saw on May 1 the first steps taken toward the construction of the "land" battleship U. S. S. Recruit and on May 30 Mayor Mitchel turned over the novelty to the Navy, represented by Admiral Usher.



FIG. 1—EARLY STAGE OF FRAMING AT THE BOW

In Fig. 1 is shown the framing of the bow at an early stage of the work. Here may be seen the vertical 2 x 6 in. studs, cross bridged, supporting the doubled 3 x 12-in. girders which carry the main deck load at the sides. The front end of the girders rests on heavy vertical timbers to which are attached the curved members which bring the bow to the required shape. The studding at the sides were likewise built out by means of lookouts as shown in Fig. 3, which is a later view from the inside taken near the bow. These two illustrations show the method of framing adopted for the sides.



FIG. 2—THE FRAMING AT THE STERN OF THE SHIP

A view of the framing at the stern is shown in Fig. 2. The vertical studs were first placed as before and then the curved members were put in position. This illustration also shows the sills supporting the studding.

Owing to the necessity for speed in construction, it was essential that complicated framing be avoided as much as possible. If regular ship construction were followed, much time would be consumed in getting out the various members, so it was decided to make of the affair, what was practically a straight house framing job, forming the curved portions of the ship by lookouts shaped to conform with the design and fastened to the vertical studding.

A scale drawing showing a typical section of the

framing at the sides is given in Fig. 5. A plan of the framing is presented in Fig. 6, which indicates the girders supported by posts as shown, the floor joists, well crowned, being 2 x 10 in., 2 x 12 in., or 2 x 14 in. as required and spaced 16 in. on centers. The joists were cross bridged every 8 ft. by 2 x 3-in. stuff. The ship is 200 ft. long and has a 40-ft. beam.

The fighting masts were built as shown in Fig. 4. A pole was first erected and braced by a platform, covered by canvas. Then the circular members were fastened to cross beams and received 1½ x ⅝ in. strips placed diagonally, all as clearly indicated in the picture.

A sham smoke stack, the framing of which is shown in Fig. 7, was covered with sheet metal.

At completion of the framing, canvas laid in paint was applied to the sides, thus making a smooth surface which was subsequently painted the war color of gray. The deck flooring was likewise covered with heavy canvas laid in paint, the joints being first filled with elastic seam composition.

The interior of the vessel is arranged to facilitate the examination of candidates seeking enlistment as bluejackets or marines. The center of the ship has a main waiting room flanked at either end by a section consisting of a stripping room with shower stalls, examination room, doctor's office and clerk's space. The toilet facilities are grouped on the side toward the stern and are divided respectively into a general toilet, urinals, and officers' toilets. The plumbing was installed strictly in accordance with the New York City code.

The installations embrace a fire fighting equipment including dry chemical fire extinguishers made and are supplemented by real machine guns. Signal lamps, a powerful searchlight, nautical instruments, etc., are also provided.

The cost of the ship is placed at $22,000, two-thirds of which was raised in cash by private sub-

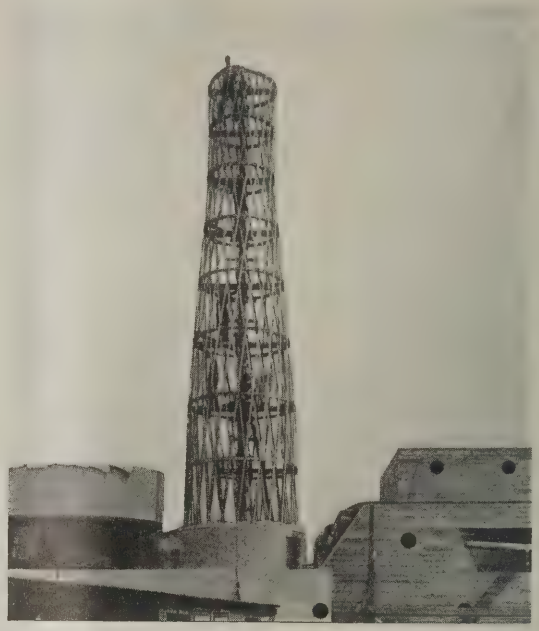


FIG. 4—SHOWING FRAMING OF ONE OF THE FIGHTING MASTS

scriptions and the rest in materials donated by various manufacturers. An average of forty-three men were employed on the job, all the carpenters who attended to the framing part being house carpenters and not ship carpenters.

The design was prepared by architect Donn Barber, and the general contractors for the work were Geo. A. Fuller Company, all of New York City.



FIG. 3—VIEW OF INSIDE NEAR THE BOW, SHOWING THE "LOOKOUTS" TO GIVE THE REQUIRED SHAPE

by H. W. Johns-Manville Company, New York City, and a complete fresh air system to humidify the air during the summer. A heating equipment is planned for the winter. Electricity is used for lighting purposes.

Big wooden guns are placed at the usual positions

EARLY USE OF BRICKS

The exact date of the use of bricks is not known, but they were certainly used in prehistoric times. Excavations have led to this discovery of the tombs of King Zer, who reigned 5,400 years B. C., or 7,317 years ago. These tombs are of brick. Bricks during this period were very common in house building, the walls being about 2 ft. thick; the size of the bricks were 9 or 10 in. long by 4½ and 5 in. wide by about 2¾ in. thick. But the art of building with bricks was far more perfect in the Mesopotamian Valley (on the plains of Babylonia).

MAKING NEW SURFACE ADHERE TO OLD CONCRETE FLOOR

The process of applying a new surface on an old concrete floor is usually attended with indifferent success, inasmuch as the new top will rarely stick to the old base. Much discussion has centered around the proper method of performing this operation, and in the following comments A. K. Siebrandt, in a late issue of *Concrete*, describes a method of overcoming this difficulty.

"From my own experience, it is evident that a new top will not stick on a concrete base that is four or five years old, because of the different action of the two masses. The old concrete has hardly any action whatever. Its shrinkage and expansion are so slight they are of little consequence, whereas the new top must go through its process of 'setting,' which, of course, causes some shrinkage, and consequently it breaks away from the old concrete, or, if it adheres to the base, cracks will appear.

"Two years ago I put a new top on some old floors. The old surface was made of 'composition,' and had all come up and crumbled away. Knowing of the difficulty of making a new top stick to an old concrete base, I took particular pains in putting the mortar down. I chiseled off all the old surface, then gave the concrete a good scrubbing and kept it continually wet, as there were four steam pipes running through the 8 x 12 ft. room; also heat from the room below, which kept the floor always warm. Next morning I again wetted the concrete thoroughly, then scattered neat cement over it, took a broom and swept the cement all over the floor so that cement paste covered all the old concrete. Then I proceeded to put on the top a 1:2 mixture, taking care that the old concrete was always wet.

"In putting down the top I had it at a jelly-like consistency, so that it worked easily, and before I rodded it off I worked a thin layer like plaster, putting on lots of elbow-grease, so that all the holes and cracks in the old concrete would be filled with mortar; then I went over with the rodding stick three or four times, with a zigzag motion. In finishing it, I gave it four floatings, then trowelled it to a glass finish. It was a splendid piece of floor, and I was well pleased with the work, thinking, of course, that I had succeeded in putting a new top on an old floor without having it crack.

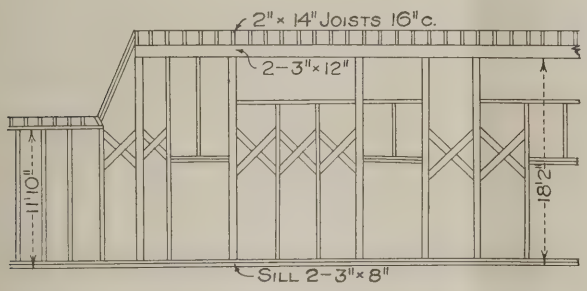


Fig. 5—Typical Section of Framing at the Sides

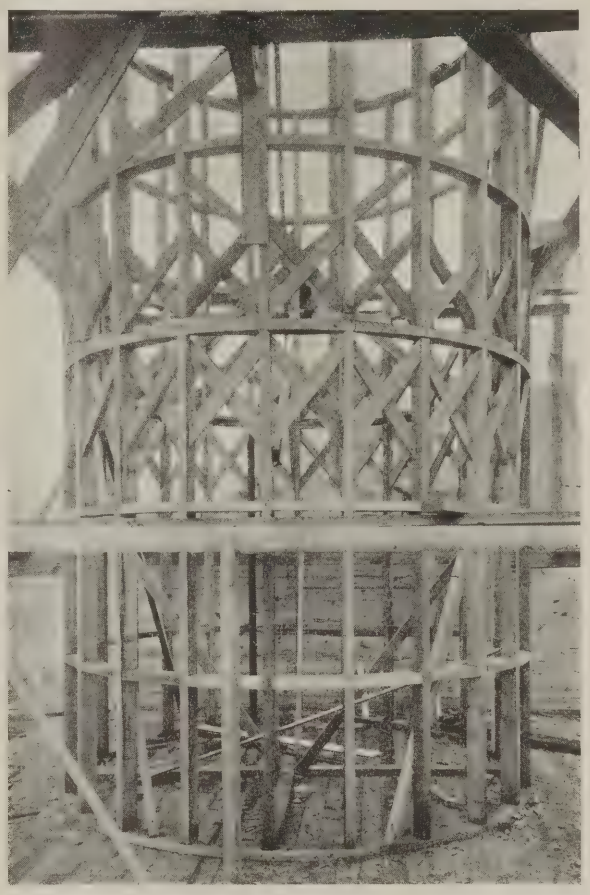


Fig. 7—Framing of a Smoke Stack

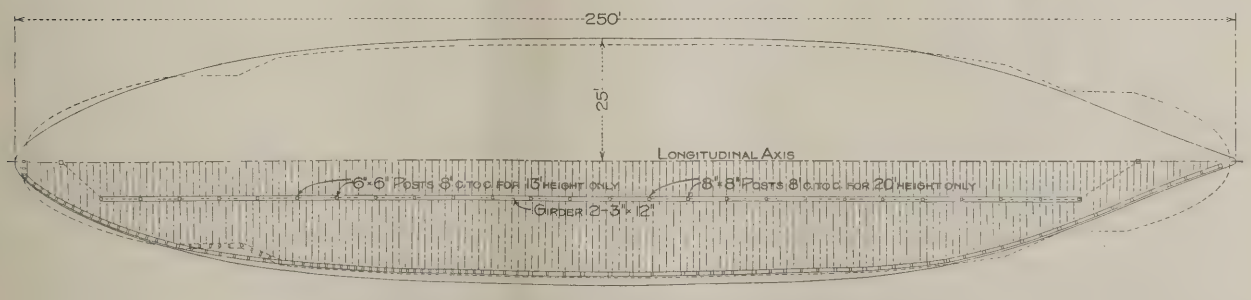


Fig. 6—A Plan of the Framing Showing Sizes of Important Members

SOME FRAMING DETAILS OF THE "LAND" BATTLESHIP

"My joy was of short duration. As spring came and the heat was turned off from the buildings and the temperature changed, the floor cracked badly.

"This winter a large slab of the composition floor was torn up in two large dormitories. Again I had to make repairs with concrete.

"I chiseled some of the old concrete off, so that I would not put less than ¾ in. of top on; then stretched a wire netting (chicken fence wire), and fastened it to the concrete, and proceeded as before, giving the floor a good wetting and sweeping a neat cement grout over it and trowelling some of the mortar in. As soon as it was ready to finish I laid it off in blocks 25 in. square and cut the top with my pointer clear down to the old concrete, just as I would have jointed it off with the jointer; but I didn't use the jointer. Then I trowelled over the cuts. As the floor was finished there were no cuts to be seen. Two days after very fine hair joints appeared where I had cut the top; they could hardly be seen except by stooping down and looking for them. No other cracks have appeared, except in the corner where the steam pipes were and where the top had dried too quickly and a few heat cracks appeared. Otherwise the floor is sound and solid.

"I have never before seen this method suggested. There are floors laid with joints, but they have objections, whereas the hair joints that I made leave the floor smooth and level and are quickly and easily made."

ARCHITECTURAL TERRA COTTA WITH REINFORCED CONCRETE

In the construction of architectural terra cotta no hard and fast rules can be laid down. The material itself is so versatile and is adapted in so many different ways, that the methods of construction have to be flexible.

Every different application and even every different contract must be especially considered, and the method of construction—the anchoring, bonding and jointing—must be determined in detail before manufacture begins.

It is logical that the manufacturer should make the construction drawings for the builders' guidance just as he makes his own working drawings, says Edward H. Putnam in a recent issue of the *Architect and Engineer*. No one else understands architectural terra cotta so well, and in fact a great many builders who have used terra cotta frequently have but little conception of the factors that must be considered in its construction, simple as these factors are.

For this reason the manufacturer on every contract makes construction drawings that are complete down to the most minute detail. The drawings, of course, are in accordance with the architect's design, and are subject to the architect's approval, but the architects depend largely upon the judgment of manufacturers of recognized responsibility. Frequently the manufacturer's service includes the actual erection of the terra cotta. The best manufacturers are ready and more than willing to undertake the complete contract from the beginning until the terra cotta is set, and generally such a contract can be executed in less time and with greater economy than if the terra cotta is handled by the general contractor.

If the general contractor does handle it, however, he should engage a terra cotta fitter from the manufacturer. The better manufacturers have especially trained men for this service. One man can generally oversee all the terra cotta work on a building, and as this man not only superintends the terra cotta setting, but does a large part of it himself, he should naturally be on the general contractor's pay roll at the regular union wages.

In connection with reinforced concrete, architectural terra cotta is used in two ways, which may be roughly classed as the "decorative" and the "practical," though in the latter class the decorative and the practical are generally combined.

In the purely decorative form of construction the terra cotta is used for architectural trim; for entrances, windows, belt courses and perhaps for the cornice. Generally it is modeled and frequently brightly colored, for polychrome terra cotta is very effective against a gray background of concrete.

In the practical form the terra cotta is used as a complete veneer for the entire building, as a protection against fire and weather, and for greater cleanliness. As glazed terra cotta can be readily cleaned down with soap and water, and reflects the greatest amount of light, it is frequently used for interiors of bakeries, dairies and the engine rooms of power houses. Any decorative architectural treatment that may be suggested can be incorporated easily in this type.

HOW TO USE UP OLD VARNISH

In the case of old varnish of good quality that had become very thick by exposure and also rather gummy, a Massachusetts correspondent of the *Painters Magazine* wanted to know how it could be treated so as to make it workable and useful. He stated that he had tried to do it by boiling with linseed oil but with poor success. The authority in question furnished the following reply: "The success of this depends upon the degree of saponification. When the varnish has lost its volatile thinner and has become stringy and ropy, there is no process that will bring it back to life, without which it is not safe for use. Linseed oil, at any rate, no matter how highly heated, will not redissolve the resinified oil and gum. If not too far gone, turpentine or benzine will take some action on the residue by heat, but it will hardly pay for the risk and trouble.

"When varnish has simply thickened, to a certain extent, it can be made workable by placing the container in a hot-water bath and heat up some turpentine or benzine in the same manner and to a like temperature, then mix by thorough stirring."

MAKING ICE HOUSE FROM AN OLD BARN

A JOB OF WORK ALMOST ANY COUNTRY BUILDER MAY BE CALLED UPON TO EXECUTE

BY OWEN B. MAGINNIS

BUILDINGS which have outlived their usefulness for one purpose may frequently by alteration or remodeling be made useful for another purpose, so in the present article it is the intention to describe how a job like this was actually carried out and in addition present some information which will perhaps be found applicable in many alteration problems by those interested.

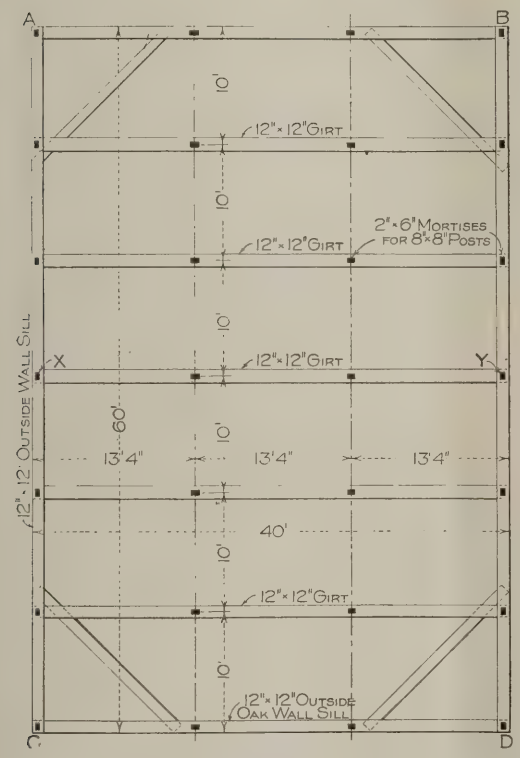


FIG. 1—PLAN SHOWING SOME OF THE FRAMING

In the present example the barn was a very old structure, having been built, judging from the materials seen in its construction, about the beginning of the nineteenth century and was originally used for the storage of hay, fodder and the like. Its dimensions were in plan about 60 ft. in length over all, 40 ft. in width and 16 ft. in height to the top of the wall plates as seen on the plan and in the sectional elevation of the original structure presented in Figs. 1 and 3.

The plan shows the general layout of the main floor timbers, which were of hand axe and adze-hewn oak, cut in the adjoining woods, straightened and squared to the dimensions given. It may be interesting in this connection to state that the barn was located in Orange County, N. Y. It is significant that each of the five 12 x 12-in. cross girts shown and the gable sills *A-B* and *C-D* were each one entire log or tree trunk, while those on the side walls *A-C* and *B-D* were each in two lengths, a splice or scarf, as in Fig. 2, holding them together, and into the middle of which the mortise for the tenons on the feet or bottom ends of the posts *X* and *Y* were cut and fitted.

The scarf joint is, I admit, poor carpentry, yet strange to say it lasted all those years.

To prevent sagging of the floor girts 18 x 18-in. stone foundation piers composed of field stones squared were built to come under the interior 8 x 8-in. oak posts placed 13 ft. 4 in. on centers as represented in Fig. 3 and 10 ft. apart longitudinally as indicated in Fig. 1. The original workmanship was undoubtedly excellent, the stonework being fully bonded and laid up in lime mortar, but in the outside walls time and weather had so disintegrated the mortar that the stones had become loosened and dropped out of place; nevertheless there was enough of it to support the sills above. The bottom ends of many of the posts and parts of the sills were also mottled and wet and had to be cut out and replaced with new timbers. In some cases it was found advisable to saw posts across about 3 ft. up and insert blocks resting directly on the stone walls beneath. When this was necessary splice or "fishplate" pieces were spiked to the inside faces and sides of the posts, thus obviating the time and expense of their removal and replacement. For it must be remembered, as a study of the drawings will show, that all the abutting ends of the heavy oak timbers constituting the frame, namely, the sills, posts, wall plates, purlines and angle or corner braces, were each and every one mortised, tenoned, draw-bored and pinned together with 1¼-in.-diameter live oak tree nails.

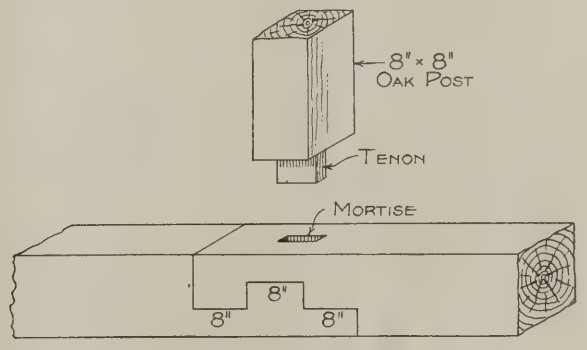


FIG. 2—DETAILS OF THE SCARF JOINT

This was evidently done by the original carpenters and builders to obtain great strength in the walls so as to resist the lateral pressures of the hay, etc., which was stored loose in bulk.

In making the building adaptable for the storage and preservation of ice, it was evident that radical structural changes would have to be carried out after its safety had been secured, so it was found that the 3 x 12-in. floor beams and the old flooring must be done away with as they were too weak to support the great weight of the ice blocks, each of which scaled from 200 lb. to 300 lb. Right here it might be mentioned that the proximity of this old barn to a river made it, when properly remodeled, a very fine ice house.

It would have shown bad judgment and have been a great mistake to have taken out the ten interior posts without having first looked into the security of the roof and made it self-sustaining, so after the outside walls had been made good new 45-deg. angle braces were spiked solid to the upper cross girts and posts and the walls resheathed with 1⅛-in. hemlock boards, thus removing all danger of collapse. Still the posts had to come out so the roof was made to support itself in this way.

By referring to Fig. 3, it will be seen that the principal 8 x 8-in. oak rafters were held up by longitudinal purlins, resting on 8 x 8-in. oak king posts, mortised and tenoned on the bottom ends into the wall plates and cross girts as well as into the purlins on the top ends. After some discussion it was decided not to disurb these king posts on account of their slight weight, although their presence would no longer have been necessary. Still they were left undisturbed and the roof reinforced by the placing of a series of 2 x 8-in. spruce diagonal braces, or, more properly speaking, struts fitted and spiked to the upper ties or girts, king posts and principal rafters to constitute each, as it were, a truss as represented in Fig. 4. This work was carefully executed by men working from scaffolds placed across the ties. The roof was found to be sufficiently safe and stable as to permit the cutting out and removal of the interior posts shown in Fig. 3. Before this was done, however, 2 x 8-in. spruce planks were set and nailed on top of the wall plates to stiffen the corners *A*, *B*, *C* and *D* and at the same time to prevent any bulging or buckling of the gable ends.

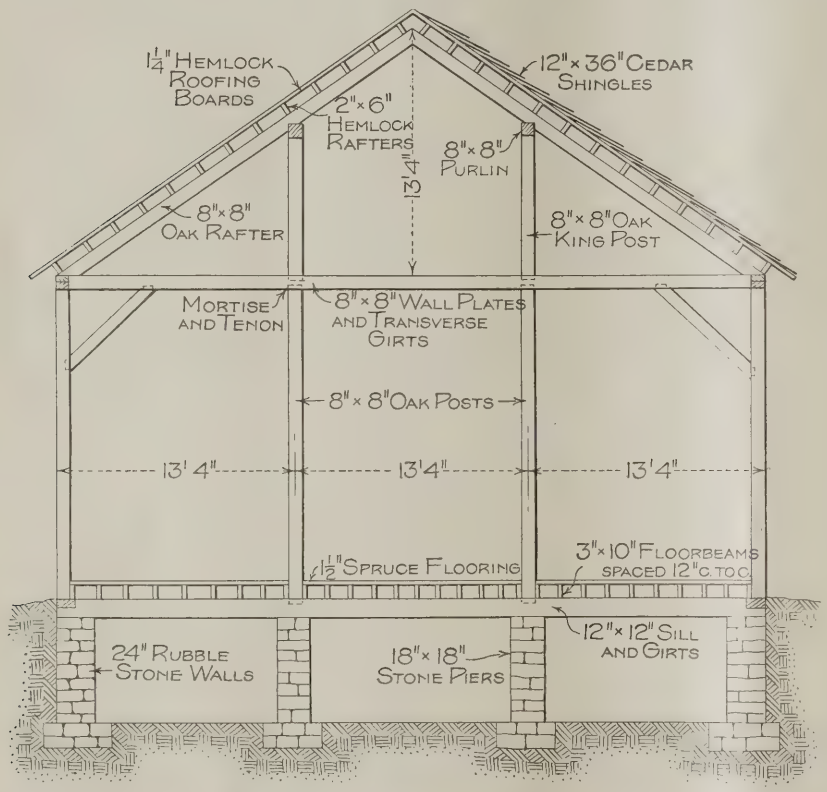


FIG. 3—CROSS SECTION OF BARN BEFORE BEING REMODELED

By carrying to completion this operation, almost all of which was done by carpenters, the building was so reconstructed as to hold 6000 cakes of ice averaging from 200 lb. to 300 lb. each.

The ice was built up in tiers starting on the ground, the line of which is shown in Figs. 3 and 4. Sawdust and shavings were liberally spread and scattered over and between the ice to prevent as far as possible its rapid melting. Right here it might be stated that the walls on the interior were lined with 2 x 10-in. spruce planks nailed to the 2 x 6-in. studding between the posts, but the ice blocks did not rest directly against this lining, being kept 18 in. away in order to admit of a layer of fine mill shavings packed in between the ice to keep away the action of the spring and summer heat. This method of shavings-and-sawdust insulation was used as a hurried expedient as time was very valuable, owing to the fact that the cold season was almost over and anxiety was felt about a possible early thaw. During the next fall, however, an insulation wall was built somewhat in the manner shown on the drawings which accompany this article.

Reference to these drawings indicate that the 2 x 4-in. spruce wall studs were covered on the outside with 1 x 9½-in. North Carolina shiplap siding and on the inside first with paper overlapped half widths and sheathed over horizontally with 1 x 6-in. tongued and grooved spruce boards. From 12 in. to 24 in. away rows of 3 x 6-in. scantlings were set so as to come in unison with the outside 2 x 4-in. wall studs and fastened thereto with 2 x 4-in. cleats nailed 4 ft. apart in height, as shown in the sections Figs. 5 and 6. These formed an inner wall, lined on the air space inside (if desired) with shiplap

and on the ice chamber side with 1¾ x 9-in. tongued and grooved spruce planks, planed one side and spiked on horizontally with 20d. wire spikes. Blocks of 2 x 4 in. were nailed on the outside studs in order to bring the cleats flat to both uprights. By the introduction of these walls and with the addition of a flat hanging ceiling of ½ x 4½-in. North Carolina matched stuff, no heat generated by the sun rays could penetrate to melt or affect the ice or cold storage.

Referring further to the capacity and weight of the ice, it may be stated that the old floor was taken out with the exception of the five oak cross girts, 8 x 20 in. in size, which rested on the inside piers shown on the cross-section. There were no scarf joints on the end gable sills, cross girts or wall plates, but only on the 60-ft. side walls and only one on each side. These rested on long solid 60 ft.-stone foundation wall 18 in. thick. All the cross timbers were of one sound 40-ft. log, each with no joints.

The ice was built starting on the ground, the cakes being placed edge to edge and carried up between the girts to the wall plates level and half bonded something like ashler stonework. They averaged 24 x 30 in. square and from 8 in. to 10 in. thick.

Storing ice, I might add, with old hay, shavings and such like is quite common practice among the farmers in the country, but they usually bury the ice in caves or cellars about 3 ft. to 4 ft. under ground.

A vertical series of four folding doors extending

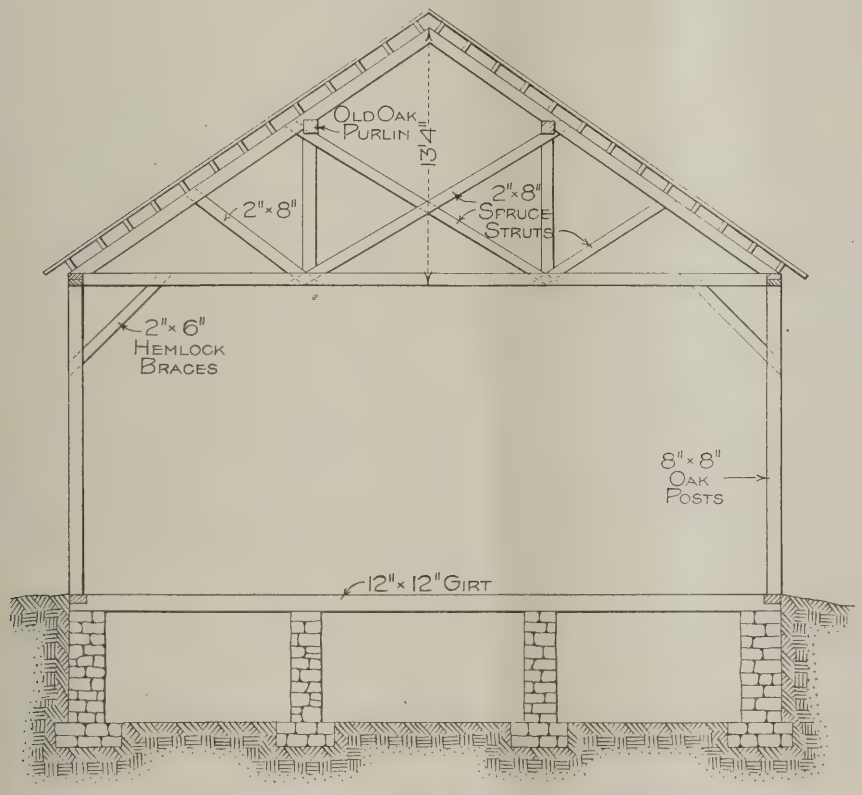


Fig. 4—Cross Section of the Building After Being Remodeled

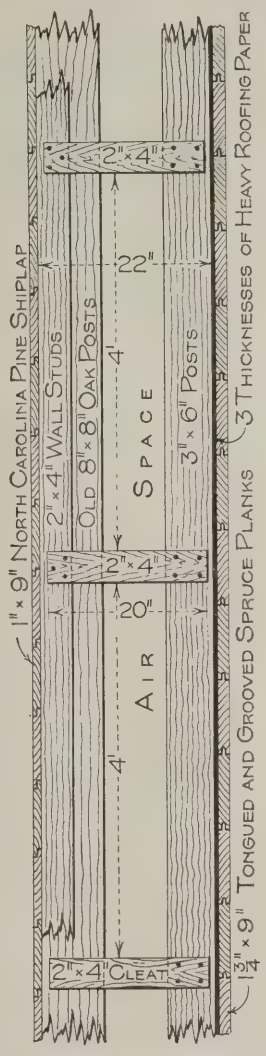


Fig. 6—Vertical Cross Section of Wall

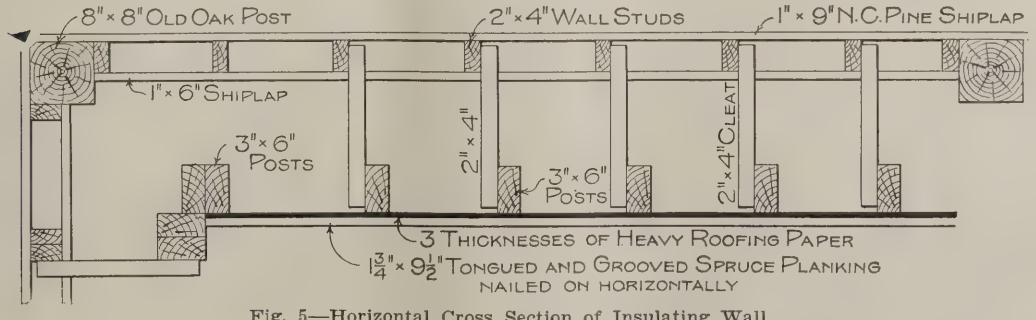


Fig. 5—Horizontal Cross Section of Insulating Wall

from the ground to the roof, one over the other, were arranged and the outside equipped with 4 or 6-ft. runways and skids with a projecting beam bracket at the ridge, and blocks and horse with tackles for the purpose of hoisting the ice blocks in or out at the different levels or tiers were provided.

It may be that in many parts of the country there are old unused buildings or barns adjacent to rivers running fresh, pure water, which buildings could be remodeled at slight expense of time and money for the uses of cold storage or refrigeration. It might be again that some readers have old or decaying buildings which might be economically repaired so as to be useful for some purpose, and that with the opinion and advice of a skilled and experienced builder they possibly could be made profitable. However, at the time of the year when ice harvesting is proceeding the information and suggestions presented herewith may perhaps prove valuable and interesting to many builders throughout the country.

MASTER BUILDERS' ASSOCIATION OF BOSTON, MASS.

One of the recent Monthly Letters of the Master Builders' Association of Boston deals with the story of its origin, its purpose and general form of organization together with its method of operation and its significance. It is interesting to note that the association is an outgrowth from the old Mechanics' Exchange of Boston and was organized in the winter of 1884-1885, taking charter under the laws of Massachusetts on Feb. 17, 1885. The prime cause for the creation of the organization was the desirability of having all reputable concerns engaged in carrying on the various branches of building work in Boston and vicinity joined in common purpose, first, to define and to preserve the principles and methods in the conduct of business that tend to make the service rendered to clients satisfactory, and relations to and with each other just and harmonious, and second, to act unitedly in defense of collective or individual work whenever and wherever they may be assailed. What Secretary W. H. Sayward has further to say in detail in the Letter in regard to the matter cannot fail to be appreciated by builders generally.

NEW METHOD FOR CONCRETE FLOORING

A recently patented system for reinforced concrete flooring was applied with success to a six-story apartment house erected in Paris. All the floors, as well as the roof terrace, were constructed on the new method of molding, which is the invention of Engineers Ferrand and Pradeau. A series of reinforced concrete beams running across the building in the usual way, serves as the basis for the flooring. A set of light planks is laid from beam to beam for scaffolding, and properly spaced at even distances.

There are prepared hollow molds in plaster about 8 ft. long by 5 ft. wide, and about the thickness of the flooring. Such molds have a somewhat elliptical curve at the top, with straight flat bottom and somewhat inwardly sloping sides. All the plaster molds are laid upon the planking end to end, and there is a certain space between the sides of the molds, that is where they rest upon the planking end to end, and there is a certain space between the sides of the molds, that is where they rest upon the plank; this latter of course running parallel to the molds. Then reinforcing iron rods are properly laid down, and concrete is molded on after the usual manner. The part of the concrete that lies between the plaster molds thus forms a series of vertical webs, limited at the bottom of the wood planks, and as the concrete is put on to several inches above the tops of the plaster molds, it has a flat surface all over the floor.

The plaster molds remain in place and are part of the flooring, being buried in the concrete, except on the under surface, and aid in consolidating the floor, for such molds themselves are braced in their hollow cavity by two vertical webs in the middle, the walls and webs of such molds being a few inches thick. Combined with the concrete, this makes up a solid floor, and what is of great advantage is that there is now given an under surface (formed for the main part by the flat bottom of the plaster molds), which is ready to receive the ceiling plaster, without the use of lath or any other preparation.

After the cement has set, the wood planking is withdrawn from underneath, for according to the reinforced concrete construction, the flooring is made to rest eventually on the main stringers of the house, the under boarding being only to uphold the work during the molding of the concrete. Because of the air space in the plaster forms, there is given an air cushion which makes such floors sound-proof, says the *Scientific American*, this being another good point, and it is also to be noticed that the hollow plaster part makes a series of natural conduits for electric wires, piping, and the like.

NEW YORK EXAMINING BOARD OF PLUMBERS

Mayor Mitchel of New York City announces the following as the new examining board of plumbers: William H. Quick, master plumber, 272 Seventy-first Street, Brooklyn; William Doran, journeyman plumber, 1405 Nelson Avenue, Bronx; Joseph H. Jasper, master plumber, 108 East 128th Street, New York City; Alfred Ludwig, superintendent of buildings, and George T. Hammond, engineer in charge of design, Sewer Bureau of New York City.

In response to a request of the United States Government the George A. Fuller Company has submitted a statement showing that the work done by it since Jan. 1, 1915, has aggregated $71,000,000.

A BRIEF STUDY IN BRICK CONSTRUCTION

A PLEA FOR A BETTER UNDERSTANDING BY THE BUILDER OF THE RELATIVE COST OF CONSTRUCTION

BY J. CROW TAYLOR



CONDITIONS in the building world are such to-day that the average building contractor who undertakes the building of homes for his main livelihood must make a study of brick construction if he would be qualified to give the full measure of service that goes with successful business enterprise.

It can perhaps be easily established by statistics that the great majority of builders who thrive on the erection of modest homes and barns and other outbuildings are primarily and fundamentally carpenters. Moreover, there is no home built and for that matter very few buildings erected but what carpentry work is called into play in some form or other. There are building contractors who were primarily bricklayers and there are contractors who have not served their apprenticeship at any skilled trade, but a vast multitude of home builders who do a contracting business are carpenters, and many of them to-day are not as well acquainted with the fundamentals and the details of brick construction as they should be.

THE "BUILD WITH BRICK" CAMPAIGN

This is something with which he whose purpose it is to make general building his chosen calling must familiarize himself if he would get all that is coming to him and give to his prospective customers the advice they require.

The brick people as well as the lumber people are actively exploiting their product, and there are many "Build With Brick" signs to be seen about the country. Moreover, there are more people who give thought to permanence in building, and these naturally want to inquire into the costs and the qualities of building material other than lumber.

If you are a builder who specializes in carpentry work, yet seeks for general contracts, what are you going to say and do when some man who has seen one of those "Build With Brick" signs comes to you with a tentative plan for a home and asks you what it will cost to build it with the walls of brick, and how this cost will compare to building the walls with lumber, concrete, tile, or a combination of them?

Are you in a position to give comparative figures on cost and to lay before him the different forms of construction that may be applicable, point out their merits, their relative cost, and the difference between the cost of building with the various materials mentioned? Have you the information at hand to furnish the answer to these things, or will you have to first hunt it up, ascertaining the cost of materials and labor before you can give an answer? If you have to do these things it is in order to make a study of the construction so that you may be prepared to talk intelligently on the subject, and, if necessary, to give specific prices to the prospective builder.

WHAT THE CARPENTER SHOULD KNOW

Carpentry is a much more important item than bricklaying, even in the ordinary homes where the outer walls are brick, but too often the builder is not in a position to give offhand an estimate of the cost of brick walls, nor is he able to tell of the different kind of walls, thickness required, and what their merits are as compared to each other.

The thoroughly equipped contractor should be prepared to give a man not only information about all the different materials that may enter into a building, but he should be ready to give him prices on them at all times and to give unbiased advice and help guide his client toward the right kind of building to fit in with his ideas and purposes.

The right attitude for the builder is to give good unprejudiced advice to the prospective customer. He will find that the lumber folks, boosting lumber, advocate the use of lumber for everything, even to shingles for the roof, while on the other hand the advocates for brick will insist that brick is permanent, fireproof, and the only building material to use for house walls. In between will come the concrete man and the stone man, until the whole thing is more or less confusing. The building contractor should make it his business to study all these things so that he may be in a position to give wise counsel to each prospective builder. There are some whose needs may call for one, some for another, and the building contractor should be in a position to give sound advice as to what to use in a given case.

DATA AS TO COST

The first essential in the study of brick construction to get a working basis is some data as to comparative cost. In order to avoid confusion we may make this data at the outset apply only to outside walls, for the average home of modest cost is built only with brick outer walls, the inner walls being frame, pretty much the same as if the outer walls were of frame.

The lumber people, some time ago, in mapping

out a campaign to boost lumber for building, employed an architect of the Building Department of Chicago to draw up some figures of comparative cost as they were to be found in that city.

He said that he found it difficult to give comparative cost because of the difference in design and the fact that houses are not standard even as to outline or to the manner of construction. However, he drew plans for a number of small buildings and let the contractors figure on them. He made the plans identical in outline for brick and for frame. About the only difference between them was the frame building called for shingle roof while the brick building called for a non-combustible roof.

Taking the average bid on these buildings, the results showed that the cost of brick walls was such at that time as to make a building of the type of the average one-story cottage cost in the aggregate approximately 10 per cent more than if built of frame.

Since the difference in cost is altogether in the walls, it naturally follows that as the type of building is varied the relation of this difference will vary. Moreover, any house elaborately finished in fancy hardwood will run up a total cost so much higher than the plainly finished one that the percentage of difference would be smaller. Other factors that enter to make a difference are the relative prices of lumber and of brick, also of the work of carpentry and bricklaying.

In the case referred to above the brick was estimated to cost from $16 to $17 per thousand laid in the walls.*

Analyzing these figures, and reducing them to wall cost, the same architect obtained the following results:

Frame

	Square Foot
2 in. x 4 in., 16-in. centers, yellow pine studding	5c.
1-in. x 6-in. sheathing and 1 layer of paper	5c.
Cypress drop siding	6c.
Painting	2c.
Total	18c.

Brick

8-in. common brick side wall	21 to 22c.
4-in. face brick and 8-in. common brick front wall	45 to 50c.

In this estimate the figures were necessarily limited to certain types of construction, and naturally the estimates will vary with different forms of construction as well as with different thicknesses of walls and the different classes of brick used.

The only way a man can get intelligent light and dependable data upon this subject is to make a study of the different forms of brick construction and figure out the relative cost of each, as well as develop the points of merit and demerit, but especially the points of merit.

Broadly speaking, brick construction can be divided into brick veneer over frame construction, solid brick walls, brick veneer and hollow-tile construction, and brick wall construction with interior frame or furring.

Then there enters the matter of different thicknesses for walls for various types of buildings and the use of face brick, face brick in front walls, face brick in side walls, and face brick all around. In fact, there are a multitude of subdivisions and many different forms of detail to be worked out in brick construction, just as there are in frame construction. Some of them have important bearing upon the item of cost, while others do not materially alter this item, the cost remaining substantially the same, just as in putting up frame buildings certain differences in detail may cost more or may not. The point to it all is that to be well informed the builder should be conversant with the different forms of construction and in a position to give figures on their relative cost or on enough of them at least to outline to prospective builders what the cost of one form will be as compared with another.

*This article was prepared before the radical advance in prices of building materials had occurred.

QUARTERED-OAK FINISH

While way back in the pioneer days we quartered oak by riving it into boards and shingles, quartered oak for interior finish to architects' specifications is not very old in this country, says the *Wood-Worker*. One of the stories as to its origin here is that an architect named Thayer, of Boston, specified quartered-oak finish on a job back about 1871. It is said that the lumber for this finish was gotten out in Monroe county, Indiana, at a saw mill owned by J. L. Rumbarger. This is one story of the origin of quartered oak in this country. Quartered oak and the beauty of its figure must have been known in the old country long before that. Perhaps some one reading this may be able to furnish further light on the subject.

A REPORTER'S DESCRIPTION OF A THEATER BUILDING

The reporter of an Arizona newspaper wrote this description of the plans for a theater building:

"The front will be in French Renaissance style, somewhat rocco, which is to say, an exaggeration of the Louis Quinze style. The splendor and elaborateness of this decoration is particularly suited to a playhouse. The vestibule will have a barrel ceiling. Shells and scroll work on the exterior will be outlined by indirect lighting.

"The proscenium arch will be treated in Renaissance. Indirect lighting also will be used in the interior. There will be a marble dado and tile floor.

"The building can easily be converted into a summer theater by means of sliding sections in the roof, of which there are ten."

LOWER BUILDINGS FOR PORTLAND, ORE.

The new Building Code reported to the Portland, Ore., City Council by the Building Code Committee provides for a reduction in the height of buildings to eight stories or 110 ft., with the proviso that buildings may be built higher than this if for each four ft. of additional height they are set back one ft.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

DETAILS OF A CASEMENT WINDOW

From C. L. Dean, Minneapolis, Minn.—The sketches enclosed relate to details of a casement window which I have used in dwelling houses and find it satisfactory in every way. The simplicity of operation is the most pleasing part of this window to me, as it can be opened and closed with almost no effort at all. Fig. 1 shows the elevation of the window glazed with 20 by 36 double-strength glass.

When the width of glass in in-swinging windows is not over 20 in. I find they are not in the way, to speak of, providing the bottoms are high enough from the floor to clear ordinary furniture —say 4 ft. from the floor.

In my judgment, on account of simplicity they are preferable to double hung windows and should be used as much as possible where light is required, but the view is not sufficiently essential to require the low window.

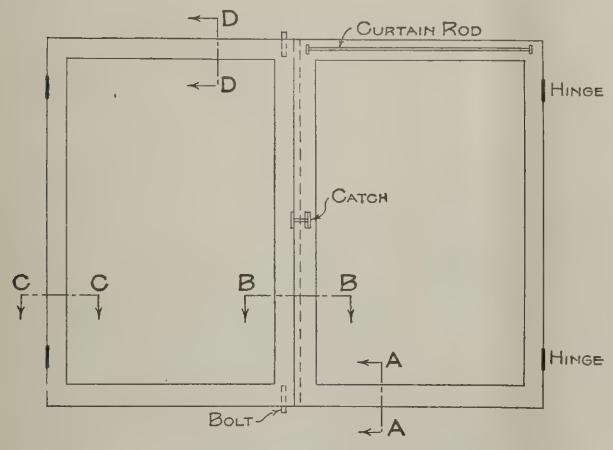


Fig. 1—Elevation of the Casement Window

The details presented in Fig. 2 relate to a window as near wind and rain tight as an in-swinging casement can be made and allows for the use of screens and storm windows outside without interfering in any way with the operation of the casements.

To shut off the view and keep out the sun we used a silk overcurtain operated with cord and pulleys in preference to roll shades.

The hardware is very inexpensive and the sash are easy to fit and hang; in fact, the whole window is about as simple in construction and operation as any good window that can be made.

Last year we installed in my own house two sets of these windows, in the side of the living room where double-hung windows had formerly been used. They certainly make a charming window, and I am surprised that casements are not in more general use in this country.

TROUBLE WITH SHRINKING DOORS

From W. M. D., Baltimore, Md.—In reply to the inquiry of "W. W.," New York, in regard to shrinking doors, I would suggest giving the doors and other trimmings for the house a chance to keep their shape, then there will be no need of adjustable jambs. The general custom with carpenters is when the plastering is dry on the surface to place the mill work in the house while the lath, studding and all other woodwork is soaked with water. As a natural consequence the dry material absorbs the moisture until the whole lot is of one degree of dampness. Work fitted up under these conditions must necessarily shrink, the casing miters open, the door panels and molding joints, etc., shrink and open—all for the want of a little judgment in keeping the material out of the house until it is thoroughly dry.

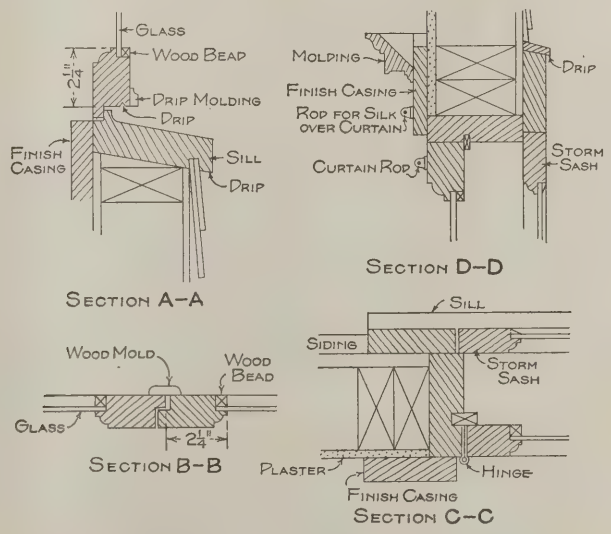


Fig. 2—Various Details of Construction

QUESTIONS IN FLOOR CONSTRUCTION

From R. W. B. Graham, Cobalt, Canada.—I would like to receive some information through the correspondence department of the BUILDING AGE, as to the least expensive method of supporting a floor 30 x 130 ft. on which there will be 150 tons dead weight and about 1 ton live weight. The wall will be constructed of 2 x 6 material. The 30 ft. is to be one span not supported by posts from the lower floor.

The advice I need is in regard to wood and truss rod construction. I do not desire information on steel I-beams, as they are too high in price at the present time to be considered. If some of the practical readers will enlighten me on the points I have raised, I shall greatly appreciate it.

GETTING OUT HANDRAIL WREATHS WITH THE BAND SAW

From Morris Williams, Richmond Hill, Long Island, N. Y.—Regarding the illustration referred to by "W. W." on page 328 of the June issue of the BUILDING AGE, I beg to say that I remember its appearance in the paper when it was known as CARPENTRY AND BUILDING, and have been over my files trying to find it but did not succeed in locating it. At the time it appeared, I remember that I decided it was of very little use because it was a method of cutting the rails obliquely from the surface of the plank which at present is not required because the systems of handrailing to-day are based on cutting out the rails square to the surface of the plank.

COMMENT ON MILK HOUSE AND SMOKE HOUSE CONSTRUCTION

From W. S. Kaiser, Farm Building Expert, Portland Cement Association, Chicago, Ill.—I have read with a great deal of interest the article in the May issue of BUILDING AGE entitled "Some Miscellaneous Farm Buildings," submitted by W. E. Frudden. There are several comments which I would like to offer in regard to the structures described in this article.

Referring to the plan of the milk house, I do not concede that 24 in. is a satisfactory width for the cooling tank. The ordinary milk can has a diameter of 14 in. and the tank should be at least 29 in. or 30 in. wide to accommodate two rows of cans, thus utilizing the space to the best advantage. Furthermore, the bottom of the tank should be corrugated so that there will be a circulation of water under the cans to hasten the cooling-down process. It is also advisable to reinforce the walls and floor of a tank of this sort to prevent formation of cracks.

The smokehouse plan, while superior to the ordinary smokehouse, could be improved if the design were such that the smoke would not take a straight course from the fire box to the vent in the roof. In other words, there might be a better distribution of the smoke. This could be accomplished by bringing the smoke into the house at the center of the floor and having several vents in the roof at regular intervals. Besides insuring a better distribution of the smoke such an arrangement would produce a cooler smoke. The roof vents should be equipped with a damper to regulate the smoke supply.

The comments which I have presented in the foregoing paragraphs are based upon actual practice and I was prompted to offer them because I am anxious to see only the best types of structures recommended in your magazine.

SHOP AND EQUIPMENT OF ENTERPRISING BUILDING CONTRACTORS

From Kuiken Bros. Company, Inc., Fairlawn, N. J.—In answer to the Editor's request for information regarding our shop and equipment as well as for data showing the advantages of motor truck as compared with horse team, we are sending herewith a pencil sketch of the floor plan of the shop which may be of interest to readers of the BUILDING AGE, also information covering the points named. The picture of the shop was taken a few years ago but will doubtless afford a fair idea of the establishment we are operating.

The plan clearly shows the location of the various machines, work benches, etc., and contrary, perhaps, to common practice, our office is situated at the rear of the building but is entered from an outside door as well as from the shop direct. The street runs along the front so that material may be entered through the sliding door and is therefore convenient to the machines which occupy the left-hand side of the space toward the front.

We have a combination saw table with a 12-in. jointer on the same shaft or mandrel and at the end of this we have a chuck for boring. This machine though light in construction has given us very good service and is doing so to-day. It was purchased from the Parks Ball Bearing Machine Company in 1913 and originally intended for portable use but as the weight of the outfit was a serious problem we decided to detach the 4-hp. gasoline engine from it, and mounted this on a concrete base about 20 ft. from the saw table. At a later period we purchased a 36-in. band saw and on this we do all our bracket work as well as any other work that may come up during the execution of various jobs. A short period ago we bought a hollow chisel mortiser on which we make all our own storm sash, screens, small and special doors, etc., and we consider this a very good paying investment. This is also a Parks machine. On the circular saw table we use Huther Bros. dado heads and cutters, which give very good results.

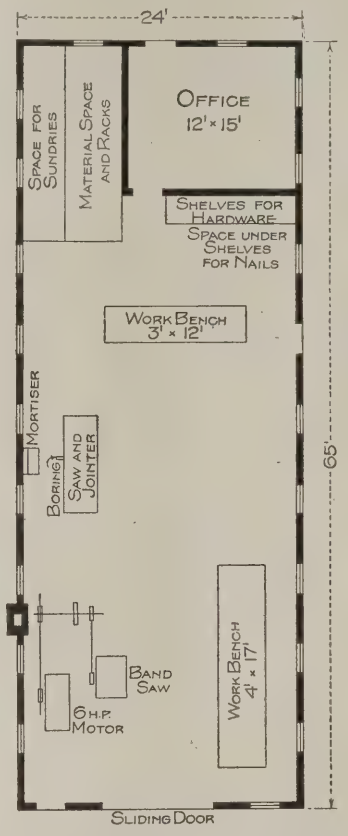
About the middle of 1916 we found that we were overtaxing the 4-hp. gasoline engine, which, as intimated above, we had purchased with our first Parks outfit in 1913, and as we did not wish to "kill" the engine entirely but would much rather dispose of it while in good running condition, we purchased from a local agent a Fairbanks-Morse

6-hp. kerosene-burning engine, which is giving good service. We can purchase kerosene at half the price of gasoline and find that this is a good paying proposition and that we have made a profitable change. We also find that it takes less fuel in proportion to run an engine that will not be called upon to make use of its full rated horsepower as would be the case in that of the 4 hp.

We have no machines equipped with electric motor and do not make use of any machines on the job as we specialize in residence work and all odd or special and minor material is gotten out at the shop and transferred to the job by our own motor truck, which is a 1-ton Little Giant, made by the Chicago Pneumatic Tool Company, we having purchased it in 1914 and it has been in constant use ever since.

Of course, we have had to make some repairs from time to time and this would probably have been true with any truck which we might have operated. The repairs have been somewhat larger than probably would have occurred under ordinary circumstances but this was no fault of the machine or the makers. Rather, they were occasioned by the bad roads which we encountered and a little careless driving, such as hitting a white oak tree and a 5-in. iron post, due to skidding, but even at that we must say the truck has taken these little bumps very well and the company has always been ready to stand by the claims which it has made for the truck.

As to the relative cost of horse and wagon against the truck we operate, we have never really kept accurate accounts, although we know from what we have on our books and considering the mileage and ing at Little Falls, N. J., which is about eight miles from the shop and which at the highest cost given above would be eight times 10 cents or 80 cents



Floor Plan of Shop Showing Arrangement of Machines



Picture of the Shop of Kuiken Bros. Company, Inc., Building Contractors, Fairlawn, N. J.

the time saved, that it certainly would pay anyone as it does us whose work is scattered and who must make use of some sort of a vehicle to get around to the various jobs.

We estimate the total cost at about eight to ten cents per mile for the one-ton truck and to give an illustration of how we estimate the saving, we will take for example the following: We are now operat- to take a load of stuff to where the two jobs are located. It takes us about 35 to 37 minutes to make the trip, and figuring the driver at 50 cents per hour would make a total cost of $2.25 for the return trip. This includes depreciation and interest on investment at 10 cents per mill. Now, the cost of a horse and wagon should be figured at $1.75 per day, including depreciation, feed, etc., for seven

days per week, but as it is used only six days, the cost should be based on six days, this having been the basis used for the truck which would make the cost $2.04 per day at 8 hours per day or 25½ cents per hour.

It has taken us, before we had the truck, two hours to go to Little Falls with a load of material which would be allowing half an hour less on the return of empty wagon and 3½ hours at 50 cents per hour, together with the cost of horse and wagon would make the total cost of this trip just $2.64, which is 39 cents more than the cost of the motor truck. That should not be considered as the only saving, for often the saving of time from one job to another with several men to transport would make the economy still greater, not to mention the added advertising one gets by giving good service and prompt delivery of men and material.

Anyone can see from this that we find the Little Giant truck a saving or paying investment, although undoubtedly there are other trucks which will do the same thing if properly treated.

Our work is principally residential work and mostly all of what we term suburban. Quite often we are ten to fifteen miles from home or shop and if at times we are operating jobs about eight to fifteen miles from each other, we find no difficulty in getting stuff to these jobs winter or summer unless the roads are very, very bad. This machine is and always has been on the job. This we could not do with horses either in winter time owing to the fact that the roads would be so bad that pulling a heavy load would ruin any horse, and in summer time it is too hot to drive a horse at any fair rate of speed. On the other hand, our truck will go in summer and winter without the least difficulty, and get there quick—something that is very important in these high times of labor and materials; higher than it has ever been in our remembrance.

BUILDERS AND THE ARCHITECTS' LICENSE LAW

From R. E. Oberst, Architect, Engineer and Superintendent, Milwaukee, Wis.—In reply to the comments by "J. H." of Chicago, Ill., regarding the architect's law, I would say that probably this contractor never worked after a plan gotten up by an architect who does first-class work. If the architects of Illinois make such plans as this man states there must be something wrong with the Examining Board, as only men of ability are to receive licenses. It is very essential to have an architect for each and every building, as the architect has a better idea of how a building is to be laid out. The beauty of the building is what the architect takes care of and better buildings are obtained under the architect's plans.

An architect with practical knowledge of building design and personal superintending cannot only draw the plans but also build the entire structure without the aid of a carpenter-contractor. I find that many contractors are not able to read plans properly and that is why a lot of mistakes are made by the contractor and not by the architect.

It is the contractor that makes the poor plans in most cases but I will admit that a lot of architects are impractical. All our best homes are built from designs gotten up by architects, and also most of our smaller homes. Most contractors copy the architect's ideas wherever they can and then want credit for them.

In very few cases a small contractor has any idea of stresses that might come on the different parts involved in the construction of a building, and it therefore sometimes makes it unsafe to have contractors design buildings.

A MATTER OF STAIR CONSTRUCTION

From "Efficient" (at times), Huntington, W. Va.—Am more or less interested in building and have purchased your magazine, the BUILDING AGE, for some months, with a view to obtaining new ideas on practical building and have received value for same. In your May number, page 241, I beg to call your attention to the first to second floor stairway, having only eight risers in the clear for headroom. It is a very nice plan and elevation, but I supposed your magazine was an architectural publication and not a *Ladies' Home Journal,* that appears fine but will not work out. Would enjoy your reply in the next issue.

Note.—In commenting upon the communication above, Mr. Weindorf furnishes the following: "In reference to the comments of the correspondent from Huntington, W. Va., I would state that on the second floor plan of the house published in the May number of the BUILDING AGE only eight risers have been shown, but that does not necessarily mean that there are only eight. These plans are reproduced to such a small scale that it would be practically impossible to show every detail. The plans are intended to give a better idea of what can be done and with the figures that are presented of rooms with such details as are shown, any builder who understands his business can take the plans as presented and make his own working drawings; for it is well known that many build direct from plans as published.

As the staircase of which the correspondent speaks is located in a hall with a length of 14 ft. 6 in., this is of sufficient size to take care of the headroom. Referring now to Fig. 1 of the sketches, it will be seen that by allowing 3 ft. 1 in. from the hall to the first riser down on the second floor and making the risers 7½ in. with treads 10 in., including nosing, the correspondent will have 6 ft. 6 in. headroom. This will still allow for 3 ft. in the rear of the well for passage.

By beveling off as shown at *A*, there will be obtained an extra 3 in. or 4 in. and by making the risers 8 in. and the treads 10 in. as shown by the dotted lines on the elevation, 7 ft. headroom can be obtained. If this will not be enough headroom the stair well can be carried back to the wall eliminating the passage across the rear of the well open-

ing which will not interfere with the general plan, and by allowing 3 ft. 6 in. at the top of the stairs instead of 3 ft. as shown, he will have a headroom of 8 ft. 4 in. to 9 ft., which I am quite sure will be of sufficient clearance for our tall gentleman from West Virginia.

Referring to the opinion held by many that the lines indicating risers where shown are usually re-

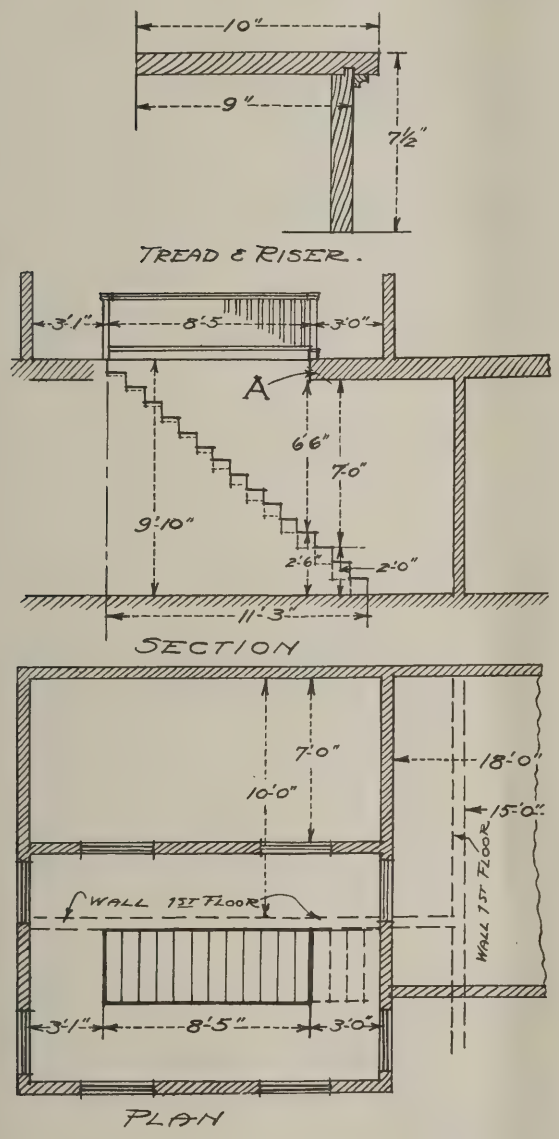


Fig. 1—Suggested Changes to Overcome the Objections Urged by the Correspondent Signing Himself "Efficient"

garded as determining the number of steps in the actual work, I desire to say that this is true on working details and sometimes on working drawings at ¼ in. to 1 ft., but on small-size scale drawings it very seldom is true.

A great majority of drawings that I have seen usually have their stairs indicated as shown on the sketch, Fig. 2, at *A*, and many show stairs as indicated at *B*. The specification usually covers the dimensions of the risers and treads and if the stairway is difficult a detailed drawing is made.

Drawing the stairs as I have, is only a means of indicating that there will be stairs where shown, and is similar to the scheme of showing a certain number of courses of shingles, etc., but which would not necessarily mean that there were that many courses in the actual work because they happened to be shown. As long as the general idea is indicated and it will work out, care can be taken of all these details.

It will be seen that the size of the hall is indicated on the plans of the house in the May issue and a detail is presented of this simple stairway. I am quite sure that any carpenter using common sense will be able to build this staircase in this hallway without any additional figures, and I would not say that the indication of the stairway on the plans is any more of an error than not showing the doors, concerning which I received comments some time ago in which the person desired to know if doors were figured as an "extra" because they were not shown on the plans. In this case the descriptive matter stated, "doors are to be of pine, stained mahogany."

From time to time similar inquiries are received,

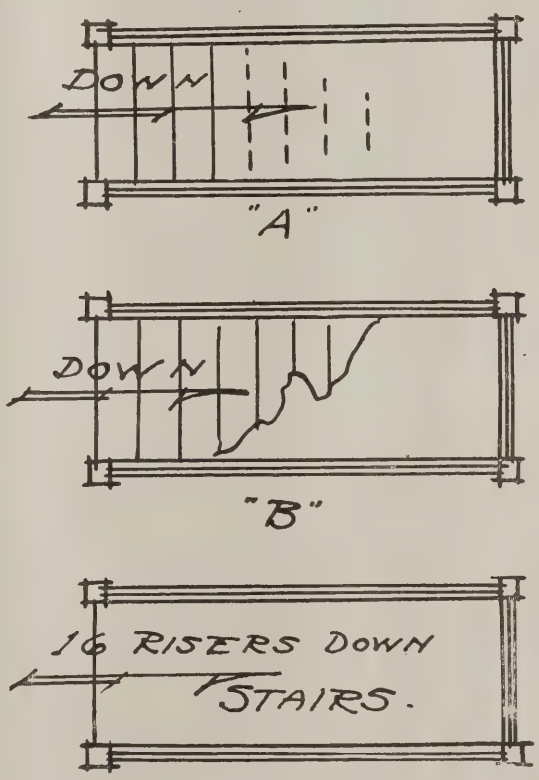


Fig. 2—Various Ways of Indicating Stairs

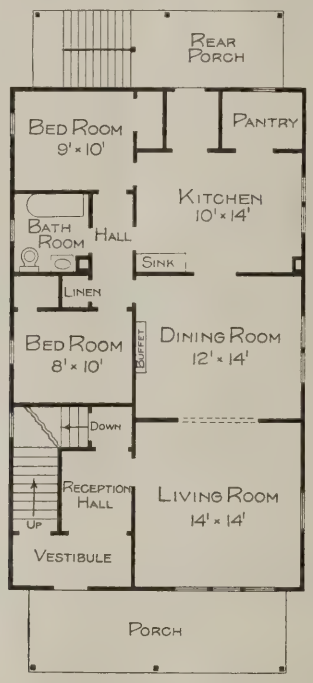
and if every item had to be shown at this small scale the plans would be unreadable, and then we would receive complaints such as I get concerning working drawings—that there is too much shown as it will cost more to build. The matter is one which may possibly permit of a great deal of interesting discussion, and if any of the readers have something to say on the subject, I certainly shall be glad to note their comments in the Correspondence Department of the paper.

I would also advise the correspondent that it would be much better to follow figures wherever given instead of making a guess at it. In this connection I wish to state that all plans which have

been appearing in the BUILDING AGE under my name can be built, as they are all worked out carefully before being submitted in final form.

PLANS FOR A THREE-FLAT HOUSE

From John Upton, La Fargeville, N. Y.—In answer to "R. H. C." of Windsor, Nova Scotia, who asked in the April issue for sketches of a three-flat house, I am sending a plan which seems to have many good points and which could be made two or three stories high as circumstances might require. It is of substantial design and may be built of brick, frame or concrete blocks. The plan shows the house to cover an area of 26 by 44 ft., but it could be made a little larger or smaller and yet



PLANS FOR A THREE-FLAT HOUSE

follow the same general layout. The outside should be made plain with roof slanting to the rear or the roof could slant to the side with parapet in front.

The windows for each floor could be placed as on the plan. The rooms on the second and third floors are the same as on the first, except that a small room, 8 x 10 ft. in size, could be included on the top floor in the corner over the vestibule, stair and hall.

Front and rear porches are nearly the full width of the house for each floor and will be found exceedingly useful.

The basement may be reached by means of the rear stairs or by the flight under the front stairs by passing through the reception hall. The little hall between the bath room and the kitchen is convenient as it gives access to the bath room from either bed room without the necessity of going through any other room. If desired, there could be a door from the bed room to the reception hall, and this would avoid the necessity of passing into the living room and through the dining room in order to reach the bed room.

The front of the living room might be extended for the purpose of a bay window, and a sleeping porch could be made on one end of the rear porch. The pantry is placed so that the refrigerator can be iced from the outside. There is a chimney through the bathroom for the heating plant and one at the side to accommodate the kitchen range.

ENCLOSING THE SECOND FLOOR REAR PORCH

From John Wavrek, Jr., Fullerton, Pa.—For a long time past it has been a source of wonder to me that builders should persist in having an open rear porch on the second floor simply enclosed by a railing. This feature is of very little use in such a condition and besides is dangerous where there are little children in the family. In addition to these objections the open porch is so much valuable space lost to the housewife which she could use very profitably if it were enclosed. In nine cases out of ten the people who buy a house having an open rear porch will have it changed either into a sun room or a sleeping porch or have it constructed in such a manner that it can be used for both.

In the last few years our mill was called upon to alter numerous jobs of this kind and the treatment which is shown in the sketches is one which we employ very frequently, with minor changes in construction but serving the same purpose.

The porch as shown in Fig. 1 has 5 in. x 5 in. square posts which are nicely adapted for the treatment indicated. However, if the posts are partly turned the problem is not more difficult and can be done in the same manner.

The brackets are the only feature which must be removed, because they interfere with the change. The railings need not necessarily be removed, but can be used to serve a useful function in the construction. They may be taken out, however, and common 2 x 3-in. studding substituted, which is cheaper and serves the same purpose. Should the railings remain then the balusters may be taken out and used elsewhere.

In the construction here described the railing used forms a very essential part of the construction. The sill of the frames is nailed onto the top rail and on the outside the panel work is fastened to both top and bottom rails, while on the inside the wainscotting or whatever treatment is desired, is also fastened to both members.

The frames are constructed in twins or triples as required at the planing mill; the sills, outside casings and inside trim being sent loose and fastened on the frames at the job.

The frames shown in Fig. 1 are of the double hung type and are constructed the same as the regular skeleton frames, excepting that the outside casing serves as a sash stop. A detail is given in Fig. 2.

If it is found desirable to have screens placed into the frames in summer, they can be fastened between the outside casings by means of spring bolts and can easily be installed either full length or only half way.

I have in another article described a method of enclosing such a porch so that it may be used as a

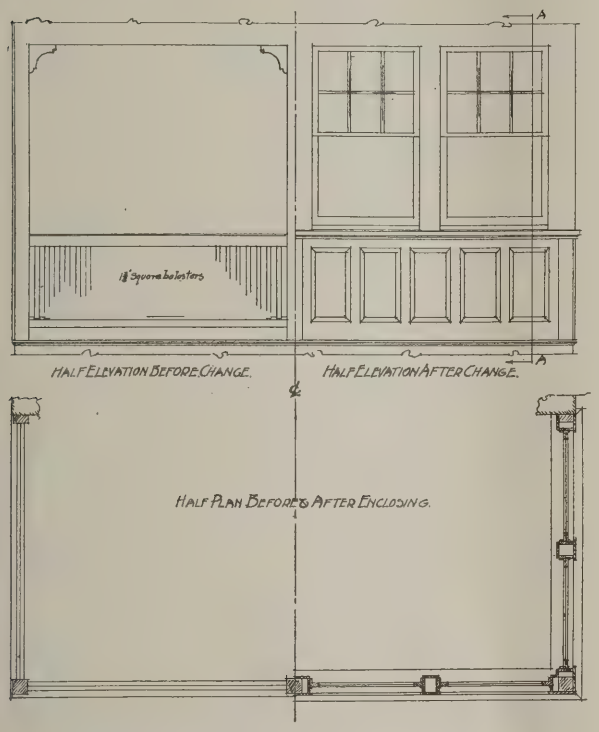


Fig. 1—Half Plans and Elevations of the Rear Porch Both Before and After Being Enclosed

sleeping place or sun parlor. My advice is that an open porch should be enclosed as soon as possible and it will never be regretted because of the many desirable features connected therewith.

OBTAINING CUTS OF VALLEYS AND HIPS

From W. W., New York City.—Although there have been many articles published upon the rafter problem, yet none of the writers seem to think it worth while to explain how to treat the valleys and hips at the foot, so that the plumb height above the plate will coincide with the common rafters, thus enabling the sheathing and plancher boards to lay even. As it is very desirable to get out this kind of work so as to eliminate any troublesome corrections, I would appreciate receiving information upon the subject.

WATERPROOFING A CONCRETE PIT FOR A HEATING BOILER

From H. J., Brooklyn, N. Y.—I notice the inquiry of "R. S. G.," who desires assistance on waterproofing a boiler pit. In William Arthur's "New Building Estimator" considerable information on this subject can be found. My experience has been along the usual damp-proofing lines which in general is to make the required foundation walls of concrete and after the concrete has been set, to mop it generously with hot asphalt or hot pitch all over the bottom and well up the sides, then heavy tar felt laid in this hot pitch will stick to the bottom and sides and a further coating applied as in tar roofing. Then another slab of concrete is poured on the bottom, its thickness de-

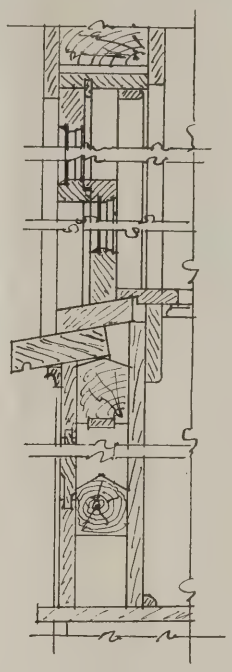


Fig. 2—A Vertical Cross Section Taken on the Line A-A of the Elevation

pending upon the hydrostatic pressure of the water. The function of this slab is to resist the up-pressure of the water. After this has set, the sides are coated with hot pitch and the felt pressed on vertically and all coated with hot pitch again. Against this a strong wall of brick or hollow tile is built as a protection of the waterproofing and to resist the water pressure. Care must be taken to prevent a tear anywhere in the waterproof felt or coating.

PROPORTIONS OF A PORCH FRIEZE

From John Upton, LaFargeville, N. Y.—In answer to "W. G. G.," Dundee, Ill., I would say that his porch frieze should be the same size as the platform below it as the projection of the roof cornice affords some protection to the floor. The frieze may be made of a single dressed plank 2 x 8 in. or 2 x 10 in., or it may be built up from a 2 x 8 with some blocks on each side. This is finished by placing a 1 x 6-in. underneath and then covering the sides with dressed boards. This latter method is used with a box cornice. The single plank is for open cornice with show rafters.

It is said that square columns of wood are one-fourth stronger than round ones of the same diameter.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

JULY, 1917

A STATEMENT OF POLICY

Effective with this issue, BUILDING AGE ceases to accept the advertising of mail-order houses selling direct to the consumer. This step is taken with a measure of regret at the necessity of severing long-standing and pleasant business relations between BUILDING AGE and these advertisers.

The decision to discontinue mail-order advertising is based upon the results of a very thorough study of the economic questions involved in the mail-order method of distribution, conducted by the present management of BUILDING AGE since its acquisition in September, 1916. Out of this investigation has come the conclusion that the interests of the general public and the building contractor are best served when materials used in building construction are merchandised through the normal DEALER channel.

The mail-order house, as a rule, makes one price to dealers, contractors and the general public. Consequently the dealer and the building contractor are both prevented from making a legitimate profit on materials bought from concerns of this class. If all business were conducted upon such a basis, the dealer would be forced out of business and all of the thousands of retailers of building materials throughout the country would have to seek other means of earning a livelihood. This, of course, is a condition which no one having in mind the industrial and commercial welfare of the country at large could possibly approve, and the very fact that such a condition would be the inevitable outcome of the complete success of the mail-order method of distributing goods is sufficient evidence that the mail-order method is economically dangerous.

The same principle applies in connection with the merchandising of many other lines of goods. The concentration of business in the hands of a few mail-order houses would eventually close practically every store on "Main Street" in the average small town, would force every buyer of goods now handled in those stores to buy from a catalog and to pay for his purchases before seeing them; all of which, of course, is an unthinkable situation and one which cannot be permitted to come about.

The dealer who buys in large quantities and sells in small quantities is entitled to buy at a lower price than the consumer should expect to pay. He is entitled to a legitimate profit in return for the service he renders his community in assembling a variety of goods that it needs, selling them, delivering them to the buyer, extending credit and performing many incidental services.

The dealer is an economic necessity. BUILDING AGE in future will advocate the marketing of building materials through the normal and logical channels of distribution, the channels that in its opinion will assure best, most efficient and economical service to the consumer and in which the retail dealer working in close co-operation with the building contractor is an extremely important factor.

KEEP ON BUILDING

Why not go ahead with that improvement you are planning? Every reason in the world says you should. At no period in our history have we been so sure of the future. The eastern world's stomach is feeling the pinch of hunger, and its demands on the products of America's broad acres and American industries are growing with every passing hour. A great market is opening wider and wider. Honest and fair profits in all lines of legitimate effort are certain. There should be no curtailment in building construction. Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. Any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity. The

country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, county, and municipal authorities should encourage the continuance of all kinds of building. The lumber, brick, cement, lime, sand, gravel, stone, and other building materials industries are basic. Neither Government regulations nor railroad restrictions should be imposed unnecessarily to interfere with them. If any action is taken which results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarass the Government in financing the war.

The right thing to do is to keep on building.

SPAIN TO ERECT PUBLIC BUILDING IN NEW YORK CITY

If the present plans are carried to completion, New York City will soon see its first building erected for a foreign government. It will be built in the lower part of the city, and will include as well the quarters for a new official bank through which the financial and commercial business of Spain with business men in America will be transacted. The proposed structure is to be twelve stories in height and of a combination nature, including besides the bank offices for the Spanish Consulate, a permanent museum of Spanish products, an immigration department, a Spanish Chamber of Commerce, and spacious club rooms on the top floor.

The proposed building will have six floors of offices which are to be publicly rented, the proceeds from which, however, will be devoted to maintenance of the structure. All proceeds beyond the actual cost of operation are to be used for charitable purposes.

The building will be known as the Spanish Bank of Commerce and its organization, which is being arranged by Leopoldo Arnaud, the commercial representative of Spain in this country, is primarily to facilitate business relations by discounting commercial bills drawn on Spain by exporters.

SHEET METAL GARAGES WITHIN THE CITY LIMITS

An important addition to the Building Code has been made which is likely to interest a great many people who have thought of setting up small buildings at the rear of their lots but could not do so owing to the law, especially those who own automobiles and desire to provide a garage for them. The new section which has been added to the code by a resolution passed by the Board of Aldermen and which became effective May 15, permits the construction in any part of the city of one-story metal buildings such as have been quite commonly used in the suburban sections for garages. The section provides, however, that these buildings "shall not be more than one story in height, and that all the sides except doors and windows and the roofs, are of the same material and construction, and provided further that the area does not exceed 1250 sq. ft. and the side walls 15 ft. in height."

ARCHITECTURE IN NEW YORK STATE

One of the amendments which has recently been made to the New York State law regulating the practice of architecture, extends the exemption period whereby certificates of registration may be issued to architects who were in practice previous to the enactment of the original registration act, namely, April 28, 1915.

Any architects who were in practice in New York State previous to that date may now secure certificates, provided their applications are filed before Jan. 1, 1918, and provided such applications are approved by the Board of Examiners. Application blanks may be secured by addressing the Department of Education, Educational Building, Albany, N. Y.

ONE FEATURE OF THE BUILDING OUTLOOK

The large amount of government work which has been planned constitutes an optimistic feature of the building outlook for the present summer. It is stated that 30 or more large camps will be necessary to accommodate the half million soldiers called out by the selective draft, and while the buildings required will not be of permanent construction they will be substantial enough to afford protection from winter weather. According to latest reports this new army will enter training about the first of September, which means a rush of work to get the new camps in readiness for them. The enormous demand for lumber is certainly a sign that considerable building is in progress. Many mills are said to be refusing orders because they are already booked too heavily. Of course, car shortage continues to hinder deliveries, but the demand is constantly increasing and prices are rapidly rising.

The William Hood Dunwoody Institute of Minneapolis, Minn., in co-operation with the Extension Division of the Portland Cement Association, has just added a concrete course to others conducted in its trade schools. It is expected that lessons in concrete will be started about Sept. 1 in both day and evening classes.

It is stated that a window area of 80 per cent can be used in reinforced concrete construction.

DECORATING THE PORCHES OF OUR HOMES

SHOWING HOW PORCHES BUILT OF DIFFERENT MATERIALS RESPOND TO BEAUTIFYING FLORAL TREATMENT

BY ALBERT MARPLE

THE question of beautifying the porch is one which, at some time or other, confronts every home owner. Very often, upon the manner in which this question is decided depends, to a large extent, the attractive or unattractive appearance of the porch. We have seen magnificent and spacious porches before costly homes which, on account of a lack of foliage and greenery, have appeared cold and altogether unattractive. When porches of this nature were before us we experienced a sort of shiver and mentally exclaimed, "My, but it must be lonesome in that house!" Everything that man could do to make the place attractive was done, but the owner forgot to put old Mother Nature on the job, and as a consequence the touch that we all love was lacking.



A STUCCO COATED SURFACE FORMS AN EXCELLENT BACKGROUND FOR NATURE'S FOLIAGE, AS SHOWN IN THE ABOVE PICTURE

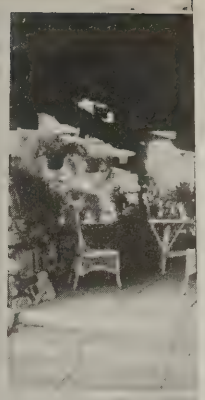
Then, again, we see at this time an entirely opposite picture. Here is a little frame dwelling of four rooms, the exterior walls being unsurfaced 1 x 12-in. Oregon pine boards, running up and down, the roof shingled and the chimney of plain red brick. There is a wooden porch running along the front, which is about 30 ft. back from the street, and a light-beamed pergola effect continuing back along the left side, as we face the home from the street. The framework of the porch is hardly visible for it is completely covered by a magnificent climbing rose vine, or rather two, one growing at each corner. This vine trails along the porch railing and up the pillars, and is almost a solid mass of foliage and bloom in its season. The framework of the arbor is not seen for a dense growth of ivy covers it. Growing in and out among this ivy is sweet-scented honeysuckle. Then around the home are dozens of rose bushes, lilies, nasturtiums, etc. What a contrast from the other home. Truly, it is hard to pass this little place. There is something that seems almost to beckon to one and to ask one to tarry among the glories that nature affords. This tiny dwelling is a home indeed. While the



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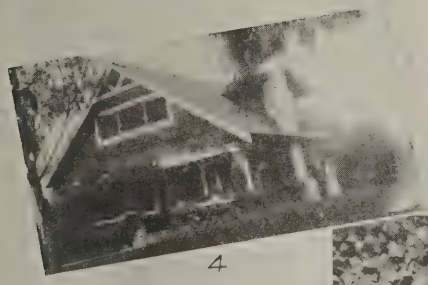


3

No. 1—How a Cobblestone Porch May Be Beautified

No. 2—A Concrete Porch Rendered Inviting

No. 3—Potted Ferns Used to Advantage



4



5

No. 4—Effective Use of Roses and Honeysuckle

No. 5—Porch Made Livable by Foliage

No. 6—An Archway of Ivy Forms Porch Entrance



6

No. 7—An Entrance Almost Hidden to View

No. 8—Another Case of the Same Kind

No. 9—Flower Holding Piers



7



8



10



9



11

No. 10—Flowers and Greenery Form a Striking Contrast Against the Light Color of the Concrete
No. 11—In This Porch Decoration Ferns and Smilax Go Hand in Hand

costly features are lacking there is something here that more than makes up for them.

This just goes to show that the question of beautifying the porch as well as the remainder of the home place is surely an interesting one. Too much thought and attention cannot be given to it, for it is this floral feature that really "makes" the home.

The question of what to plant is probably of first consideration to the home owner, and is one that must be answered by that individual alone. There are dozens of vines that may be used to train up the columns and over the porch. Roses are always acceptable and there are many of these—white Cherokee, Ladia Banksia, etc.—any of which will serve the purpose admirably well. Then we have seen porches, the appearance of which has been greatly enhanced by the old standby—ivy. There is hardly a place in the country where a slip of this plant cannot be "borrowed" from a neighbor. Possibly the neighbor would be kind enough to donate several of these slips. They should not be declined if they are offered for ivy, although "old as the hills," is indeed hard to beat as a beautifying agent. A pleasing thing about ivy is that the more you have the better it appears. Should the house be covered it is probable that there will not seem too much of it. With very pretty effect it may be grown on the sides, up the pillars, above the entrance and even over the roof of the porch. Climbing nasturtiums are often grown over the porch and add greatly to its appearance. And we have seen porches and pergolas abloom with geraniums. There is a variety of this flower that will climb, which, if grown, will add quite an unusual touch. We would not forget the smilax, boganville, and the "tried and true" honeysuckle. In fact, there are dozens of vines that may be grown with good result.

We observe, also, that the appearance of the porch is enhanced by the growing of a bank of some kind of "bush" flower immediately in front of it. There are roses, geraniums, lilies, and many others that may be used for this purpose. We have seen openings left in the top of the pillars and sides of the porch, and our curiosity was satisfied when we learned that these were made especially to hold flowers. The foliage of the plants grown in these falls gracefully over the side of the pillars and porch. The importance of the potted plant on the porch should not be overlooked. A dainty fern hung here and there or a pot of myrtle placed at some prominent nook contribute an effect that may be secured in no other way. Potter plants placed upon the railing or standing in the corners of the porch also assist in adding attractiveness to the structure's general beauty.

It is shown here that porches made of any kind of building material respond gratefully to beautifying floral treatment. We show here cement, brick, frame and cobblestone porches, and it may be seen that all of them are greatly improved in appearance by the application of foliage and flowers.

The selection of flowers and vines for the home place should not be done at random. If this is done the finished product will have a "cheap" appearance. It is best to take a little time and "look around." Observe as the evening or morning walk is being taken just what vines make the best appearance and would be best suited to the home before which it is intended to grow it. In this way a high standard may be set which will pay in the end. After the plants have been selected and the seeds or slips are in the ground care for them. Nature will take care of 99 per cent of the responsibility, but the grower must shoulder the remaining 1 per cent if a well-nourished and beautiful garden is to result.

DEATH OF HENRY FERGE

In the death of Henry Ferge, which occurred in Milwaukee, Wis., on June 4, the Northwest lost one its most prominent builders. It was he who originated and promoted the Builders' Exchange of Milwaukee, of which he was the first president. Some of the prominent buildings which he erected include the City Hall, the Library, the Wells building, the Sentinel building, the Auditorium, the Milwaukee hospital and many Wisconsin post offices. He also built the San Francisco office, which was one of the few buildings to withstand the terrible earthquake and fire.

Some of the organizations of which he was a member include the Master Carpenters' Association of Milwaukee, the Builders Benevolent Association of Milwaukee, the Concrete Builders' Association, the Government Contractors' Association, the Milwaukee Builders' Association, the Milwaukee Builders' Exchange, the Elks, etc.

ORGANIZATION OF TRENTON BUILDERS

The Master Carpenter-Builders' Association of Trenton, N. J., has recently been organized with the following officers:

President .....I. Harper Clayton
Vice-President ....Charles Y. Barlow
Secretary .....William R. Ivins
Treasurer .....Edward D. La Rue

The object of the organization is to benefit the building trades of the city and to promote increased sociability among the members. Headquarters have been opened in the American Mechanic building.

ANOTHER THEATRE FOR NEW YORK

It would almost seem that there were at the present time sufficient places of amusement in the neighborhood of Times Square to meet the requirements of the metropolis, but additions are constantly being made to the number, the latest being a two and four-story theater to be erected at 240 to 248 West Forty-third Street, New York City. It will have a frontage of 96.8 ft. and a depth of 89 ft. The facade is to be of brick, limestone and terra cotta, and the cost is estimated at $175,000. The plans have been prepared by Architect George Keister of New York City.

CURRENT NEWS OF BUILDERS' EXCHANGES

SOME IMPORTANT SECRETARY RESIGNATIONS —NEW QUARTERS FOR TWO EXCHANGES

New Building for Minneapolis Builders' Exchange

THE Minneapolis Builders' Exchange has purchased a lot on Second Avenue South in the very heart of the financial and club district of Minneapolis, and work has commenced on the erection of a 12-story thoroughly modern and up-to-the-minute office building. The enterprise represents an investment of $500,000 and was financed entirely by the members of the Exchange.

The ground floor of the building will be devoted to permanent exhibits of building materials; the basement will be arranged for an exhibit room for mechanical equipment, such as: Concrete Mixers, Heating Boilers and Electric Machinery and on the second floor the Exchange will have its executive offices and Auditorium. The balance of the building will be arranged as a general office building and will be tenanted by members of the Exchange.

On the roof of the building it is intended to build a Bungalow, showing the different styles of construction, the best materials for the different purposes and the latest appliances for an up-to-date household. The balance of the roof not occupied by the building will be treated by a landscape architect. When completed, the Builders' Exchange expects to have the most comprehensive and unique building exposition in the country.

It is expected that the building will be completed by November 1, 1917.

New Quarters for Flint Builders' Exchange

At a recent meeting and banquet of the Builders' and Traders' Exchange of Flint, Mich., it was voted to take a five year lease of a suite of offices and a large hall in the Inglis block on South Saginaw Street. The offices of the Exchange will be in the front of the building and the large hall at the side and rear will be used for display booths and for reception rooms for visitors.

Following the banquet President A. J. Beach made a few remarks regarding the plans of the builders for the coming summer. He spoke also of the demands that had been made by members of the Exchange for booth space in the Exchange rooms and suggested the need of remodeling the new quarters as early as possible.

City Engineer E. C. Shoecraft spoke on the growth of the city and James W. Follin gave an illustrated lecture using slides made in Flint and elsewhere of engineering and building work.

C. E. Smith Resigns as Secretary of the Philadelphia Master Builders' Exchange

Many members of the building trades in the eastern section of the country will regret to learn that Charles Elmer Smith who has been secretary of the Master Builders' Exchange of Philadelphia for the past twelve years, has recently resigned in order to give more time to pressing personal affairs. The office has been assigned to William H. Barrett who has been assistant secretary of the Exchange for the past nine years and is said to be one of the best informed men on building conditions in the city of Philadelphia. His selection will be regarded as most judicious, particularly at this time when the Exchange is cooperating so closely with the United States Army Engineer Corps in gathering valuable data regarding the resources of the builders of the city. The Exchange is to be congratulated in having in Mr. Barrett one who can carry forward the work in the same successful way in which it has been handled in the past.

It may be interesting to state that Mr. Barrett was graduated from Girard College in 1898; and is secretary of the Trade School—the institution started by the Master Builders' Exchange from which grew the Manual Training School Movement of the city. He was also secretary of the Advisory Board of the Exchange to which no doubt Philadelphia is largely indebted for the absence of labor troubles in the building industry during the past decade.

The members held their annual outing and shad dinner on May 17, about two hundred going to Kugler's "Old Mohegan Club" on the Delaware River. The Midway which is said to have rivalled that of the World's Fair, was a source of great amusement and carried many a master builder back in memory to his boyhood days. The shad dinner which is always a great feature at the Mohegan Club was of its usual high standard of excellence and was greatly enjoyed by the members attending.

Secretary A. H. Shank Resigned

Builders in the Northwest will be greatly interested in the announcement that A. H. Shank has recently resigned as secretary-treasurer of the Builders' and Traders' Exchange of Grand Rapids, Mich., so that he may take up the duties of the office of secretary-treasurer and general manager of the Shank Fireproof Storage Company which has recently been incorporated. The resignation of Mr. Shank means the loss to the Builders' Exchange of a most efficient officer, for during his term he has seen the Exchange grow to be one of the largest in that section of the country. This success has been largely due to his untiring and unselfish work combined with unusual executive ability.

Election of Pawtucket Builders' Exchange

At the annual meeting on June 6 of the Builders' and Traders' Exchange of Pawtucket, R. I., the following officers were elected:

President.....Peter A. Cruise
Vice-president.....Joseph F. Salisbury
Secretary.....Harry C. McDuff
Treasurer.....Ralph C. Potter

Several directors were elected, also a committee having in charge the arrangements for the annual "Outing" of the Exchange.

New Exchange at Yankton, S. D.

Among the latest additions to the list of Builders' Exchanges of the country is that at Yankton, S. D.

Forming a Builders' Exchange at Macon, Ga.

Steps preparatory to the organization of building contractors and material men of Macon, Ga., were undertaken recently when thirty leading representatives held a meeting looking to the formation of a Builders' Exchange. W. J. Beeland was made temporary chairman and given the power of appointing a committee to draft articles of organization.

BRIEF REVIEW OF THE BUILDING SITUATION

FIGURES SHOWING BUILDING ACTIVITIES IN VARIOUS SECTIONS OF THE COUNTRY IN MAY, 1917, AND MAY, 1916

A NUMBER of factors have contributed to the not unsurprising decrease of 33.84 per cent which our building report shows for 121 cities reporting for the month of May, 1917, as compared with the same period last year. Undoubtedly the prospect of the shortage of labor which will result from the drafting of a large number of our citizens has kept many builders from filing plans, the execution of which might be held up from lack of competent building mechanics. This, combined with the general unsettled conditions which always prevail at the entrance of a nation into a great war, probably accounts for much of the falling off. This decrease is not as great as first thought might suppose, for May, 1916, showed the large gain of 25½ per cent over May, 1915, and May, 1915, showed a gain of 13½ per cent over the same period of 1914. The decrease of permits for May, 1917, is confined to the Eastern and Middle sections of the country, for both the South and extreme Western sections show substantial gains.

Out of 45 cities reporting from the Eastern section of the country, 34 show a loss as against 11 indicating a gain, with a resultant falling off of 45.82 per cent.

CITIES IN EASTERN STATES

	May, 1917	May, 1916
Allentown	$170,582	$452,640
Altoona	55,789	111,740
Atlantic City	105,687	202,056
Bayonne	37,493	232,955
Binghamton	130,043	134,235
Boston and suburbs	5,859,000	5,969,000
Bridgeport	514,025	562,468
Brockton	62,899	256,905
Buffalo	892,000	1,155,000
East Orange	215,075	137,486
Elizabeth	118,934	203,658
Erie	855,176	214,800
Harrisburg	103,930	142,845
Hartford	535,934	1,118,240
Hoboken	43,913	24,640
Holyoke	45,075	304,945
Lawrence	67,305	77,900
Manchester	58,168	166,623
Newark	1,131,920	815,368
New Bedford	842,825	1,209,900
New Britain	159,120	107,832
New Haven	261,902	489,320
New York:		
Manhattan	2,744,845	18,346,772
Bronx	1,468,783	2,359,470
Brooklyn	2,533,929	5,140,611
Queens	781,095	2,369,803
Richmond	244,464	299,765
Niagara Falls	193,314	108,952
Passaic	670,125	234,525
Paterson	169,694	281,073
Philadelphia	3,558,355	4,791,255
Pittsburgh	1,433,432	1,120,675
Portland	82,948	143,820
Quincy	101,064	217,116
Reading	71,875	206,675
Rochester	746,171	982,216
Salem	49,862	93,215
Scranton	280,543	148,827
Springfield	495,140	1,158,215
Syracuse	673,836	342,361
Trenton	160,332	242,021
Troy	66,590	81,064
Utica	165,395	258,590
Wilkes-Barre	18,205	173,741
Worcester	310,527	871,102

The Middle section of the country shows a loss of 32.58 per cent, 18 out of 39 cities reporting showing a gain.

CITIES IN MIDDE STATES

	May, 1917	May, 1916
Akron	$1,689,940	$921,527
Canton	431,125	396,850
Cedar Rapids	144,000	170,000

CITIES IN MIDDLE STATES (Continued)

	May, 1917	May, 1916
Chicago	6,552,800	13,707,100
Cincinnati	2,363,730	1,043,345
Cleveland	3,185,500	2,688,080
Columbus	500,310	1,030,650
Davenport	194,913	86,418
Dayton	514,183	441,251
Decatur	148,285	108,730
Des Moines	1,256,047	971,694
Detroit	4,191,935	5,146,945
Dubuque	40,820	106,625
Duluth	278,762	7,272,845
East St. Louis	71,260	88,155
Evansville	77,047	127,175
Fort Wayne	255,541	796,225
Grand Rapids	245,804	253,970
Indianapolis	640,198	860,030
Kansas City, Kan.	196,670	57,866
Kansas City, Mo.	1,252,020	1,220,900
Lincoln	142,180	278,310
Milwaukee	1,263,870	1,109,131
Minneapolis	917,350	3,055,800
Omaha	1,008,787	961,240
Peoria	72,921	186,050
Saginaw	36,480	49,435
St. Joseph	81,563	63,945
St. Louis	1,039,241	988,540
St. Paul	1,389,604	1,360,322
Sioux City	809,167	173,460
South Bend	189,653	187,260
Springfield, Ill.	89,535	207,760
Superior	75,125	54,749
Terre Haute	27,875	164,752
Toledo	706,560	1,275,117
Topeka	87,155	223,815
Youngstown	474,805	559,200
Wichita, Kan.	194,685	307,625

The Southern section of the country reports a gain of 8.75 per cent, 99 cities reporting.

CITIES IN SOUTHERN STATES

	May, 1917	May, 1916
Atlanta	$373,171	$386,585
Baltimore	583,042	356,077
Birmingham	112,087	120,998
Charlotte	96,465	28,350
Chattanooga	72,155	446,416
Dallas	415,335	337,488
Forth Worth	265,701	146,132
Huntington	181,035	104,351
Jacksonville,	150,677	213,307
Louisville	136,310	342,620
Memphis	240,175	279,535
New Orleans	295,845	420,190
Norfolk, Va.	230,590	118,225
Oklahoma City	310,567	171,940
Richmond	1,021,095	471,471
Savannah	64,925	111,469
Tampa	66,989	275,455
Washington	1,805,200	1,304,363
Wilmington	178,363	433,936

The substantial gain of 18.16 per cent is reported from the extreme Western section of the country, with 18 cities reporting.

CITIES IN EXTREME WESTERN STATES

	May, 1917	May, 1916
Berkeley, Cal.	$110,000	$154,100
Colorado Springs	31,125	37,269
Denver	290,940	443,400
Fresno	171,500	93,241
Great Falls	129,760	326,480
Los Angeles	782,651	1,379,691
Oakland	465,430	414,407
Pasadena	111,614	154,851
Pueblo	214,264	33,624
Sacramento	121,959	158,815
Salt Lake City	329,410	396,754
San Diego	63,125	302,310
San Francisco	2,889,585	1,629,527
San Jose	160,416	30,309
Seattle	1,014,070	504,365
Spokane	476,310	139,305
Stockton	106,869	81,220
Tacoma	117,549	88,815



A COLONIAL HOUSE OF SHINGLED EXTERIOR—MILLIGAN & CO., ARCHITECTS, MOUNT VERNON, N. Y.

SHINGLED HOUSE OF COLONIAL DESIGN

THIS DWELLING WITH GARAGE IN BASEMENT FORMS BASIS OF THE SUPPLEMENTAL PLATE

SHINGLES are among the most popular coverings for a country house and many are the ways in which their rectangular outline is relieved. Sometimes the width of the courses is varied, or perhaps a wide variation in the size is employed, and then again the shape of the shingle itself may be changed from the ordinary rectangle. Among the variations of the last-named method is the cutting of the butt so that when laid an irregular, wavy line will give a softer course division than if exact, straight lines are employed.

The last-named method of laying shingles is the one used for the covering of the walls in the house under description, which constitutes the basis of our supplemental plate this month. The interior of the sun porch at the left is finished with shingles laid in the same manner, as a glance at the halftone illustration will show, and the effect is rather novel. The hangings of light blue and white give the cheerful effect so often sought in a sun porch.

The front entrance is protected from the elements by the overhang of the main roof and leads into a vestibule which communicates directly with the main hall. At the left, a large living room extends the depth of the house, with entrance to the sun porch from either side of the fireplace. To the right of the hall is the dining room.

The arrangement of the service quarters is rather unusual, for kitchen, maid's room and lavatory are entirely separated from the rest of the house. Four bedrooms and two baths are located on the second floor, one of these baths being a part of the master's suite of rooms.

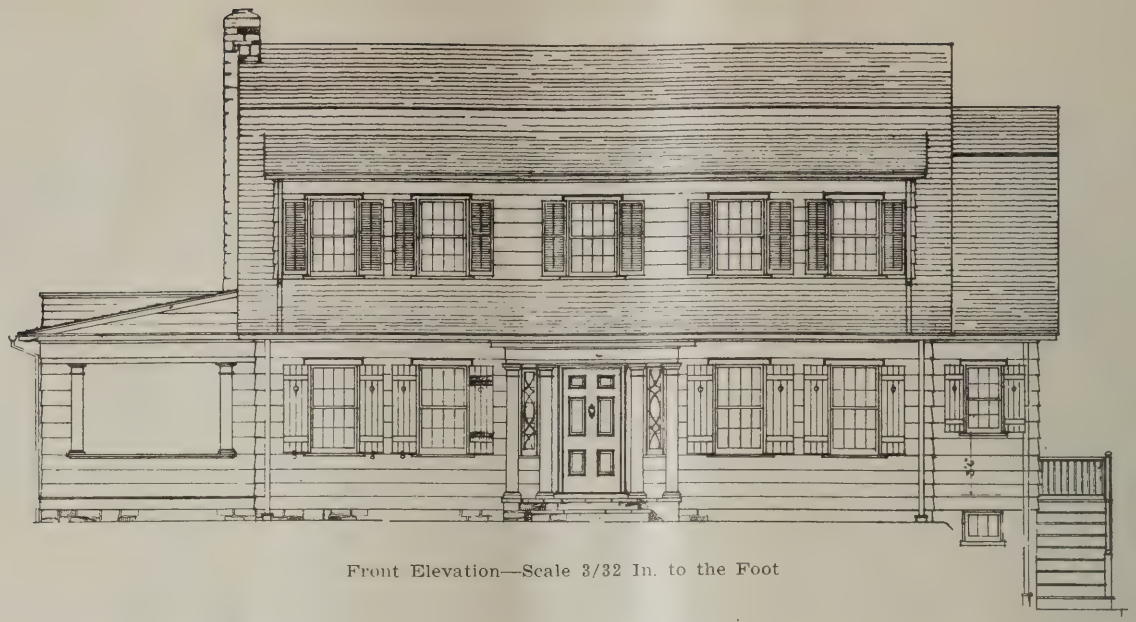
There is a garage in the basement, the outside entrance being from the rear of the house, as shown in one of the halftone illustrations.



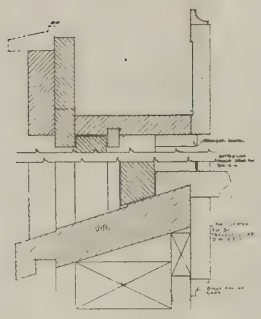
VIEW IN THE LIVING ROOM, SHOWING OPEN FIREPLACE AND DOORS TO SUN PORCH

The footings are of a 1:3:4 concrete mixture and are 8 in. thick and 30 in. wide. The column footings are 8 in. thick and 18 in. square, being provided with a bluestone template 10 x 10 x 3 in. The foundation wall is of local stone, the outside below grade being plastered smooth with Portland cement mortar. Above grade, the stone has white cement joints. The piers are of brick and of stone.

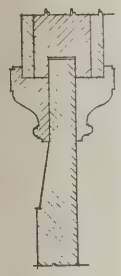
The cellar floor is composed of a 1:3:3 concrete mixture 3 in. thick over which was laid a 1-in. fin-



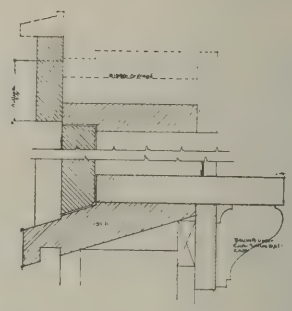
Front Elevation—Scale 3/32 In. to the Foot



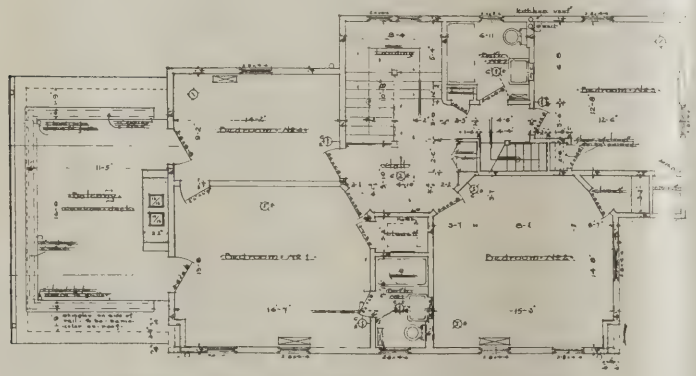
Typical Details of Windows—Scale 1½ In. to the Foot



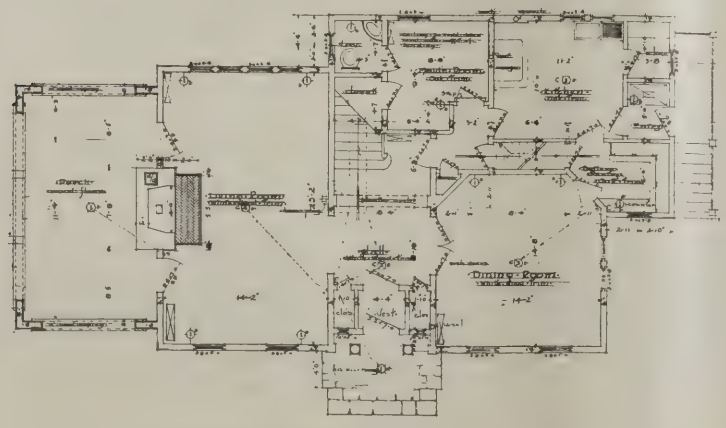
Section of Panel Moldings on Both Entrance Doors—Scale 3 In. to the Foot



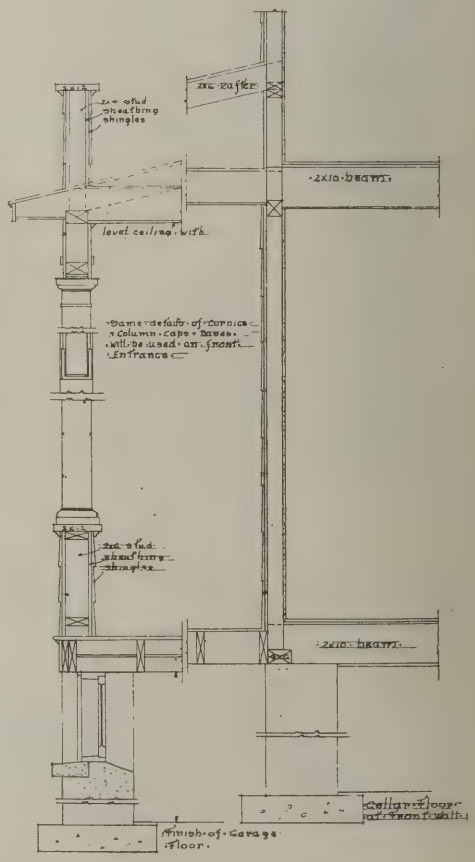
Details of Casements in the Living Room—Scale 1½ In. to the Foot



Second Floor Plan—Scale 1/16 In. to the Foot



First Floor Plan—Scale 1/16 In. to the Foot



Details of Sun Porch End of the House—Scale ¼ In. to the Foot

ishing coat troweled to a smooth hard surface, the whole being laid with a 6-in. pitch to the rear.

The chimney footing is of a 1:3:4 concrete mix-



A REAR VIEW OF THE HOUSE

ture 12 in. thick and 6 in. larger in dimensions than the chimney. The chimney is both of stone laid up with white cement joints and of brick.

The framing is of the balloon type, the wood used being spruce, except the 6 x 10-in. girders, which are of yellow pine. The first and second floor joists are 2 x 10 in., and the third floor or attic ceiling joints, which are hung to the rafters, are 2 x 4 in., all spaced 16 in. on centers. The braces and inside studding are 2 x 4 in., the latter being placed 16 in. on centers. Rafters and ridges are 2 x 6 in. Partition plates are 4 x 4 in. and partition shoes are 2 x 4 in. Each tier of floor beams has three rows of cross bridging, and the bearing



INTERIOR VIEW OF THE SUN PORCH

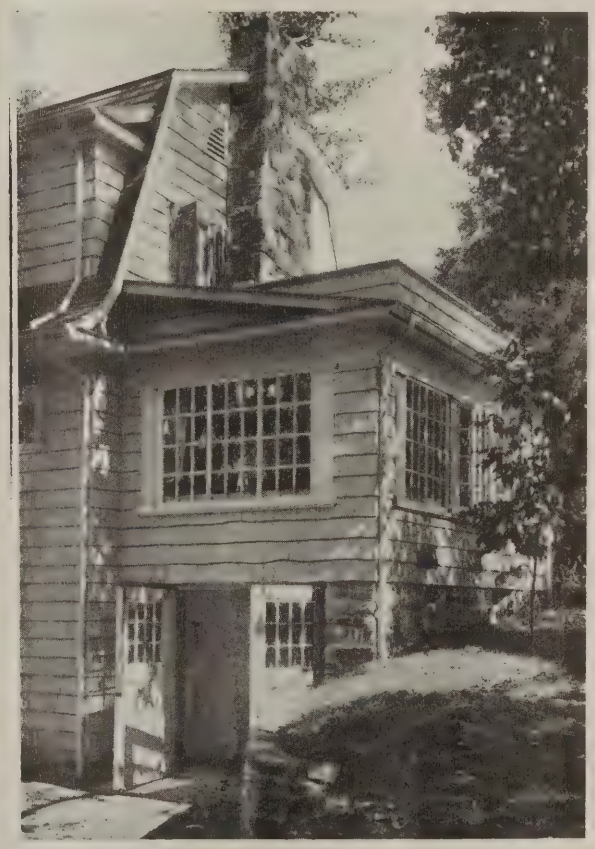
partitions have one row of bridging. The headers and trimmers are doubled.

In constructing the porch the sills used were 4 x 8 in., and the floor and roof beams 2 x 8 in., placed 16 and 20 in. respectively on centers.

The main roof and the sloping part of the porch roof have $\frac{7}{8}$ x 2-in. spruce shingle lath placed 5 in. on centers covered with 18-in. random width red cedar shingles exposed 5 in. to the weather. The shingles were dipped in green stain before laying.

The walls were covered with 1 x 6-in. tongued and grooved North Carolina pine laid horizontally over which was placed rosin-sized building paper. This received 24-in. split shingles dipped in gray stain and laid 10 in. to the weather.

The porch floor is of $1\frac{1}{8}$ x $3\frac{1}{4}$-in. fir laid in white lead paint and was given two coats of boiled lin-



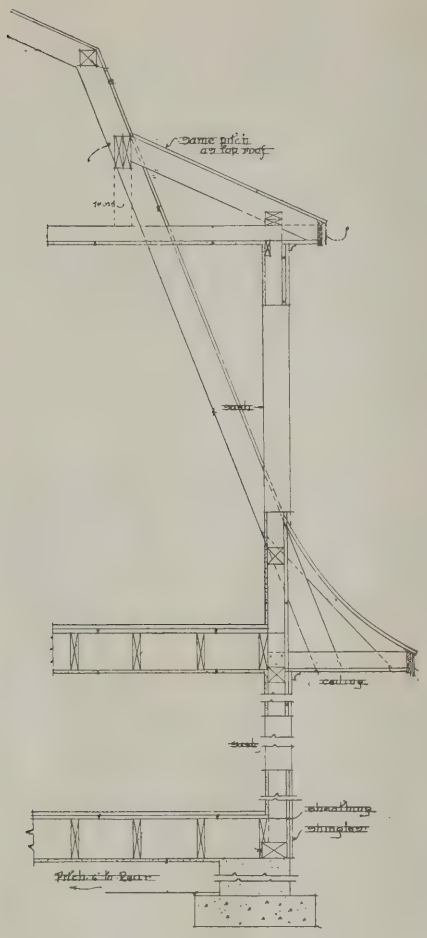
THE SUN PORCH AND ENTRANCE TO THE GARAGE IN THE BASEMENT

seed oil, spread while hot. The ceiling is of $\frac{7}{8}$ x $3\frac{1}{2}$-in. North Carolina pine, which was given three coats of spar varnish.

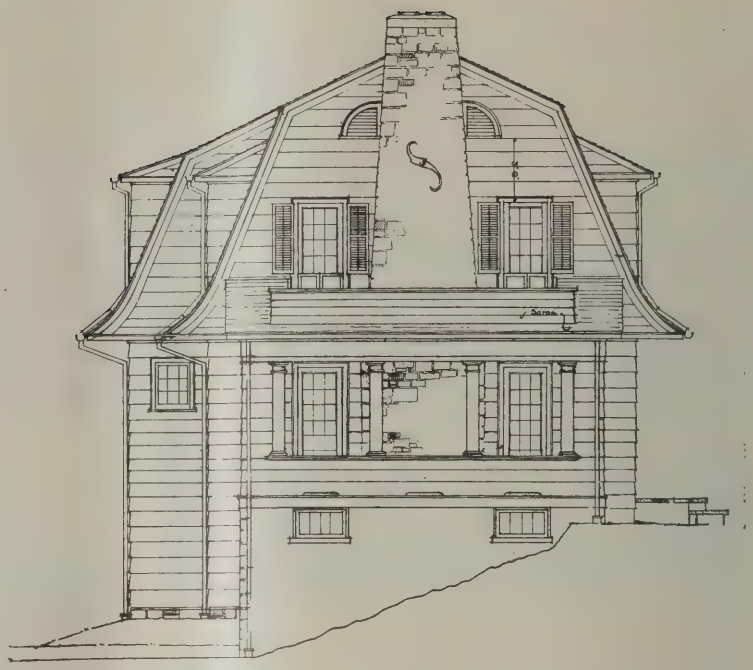
The front entrance door is of white pine $2\frac{1}{4}$ in. thick with raised panels outside. The sash doors to the porch and balcony are $1\frac{3}{4}$ in. thick and have 18 lights. Other doors are of birch, those in the first story being of a one-panel type $1\frac{3}{4}$ in. thick and those in the second story of a two-panel type $1\frac{3}{8}$ in. thick.

The plastering is three-coat work and troweled to a hard finish, King's Windsor plaster being used. Lathing is of spruce.

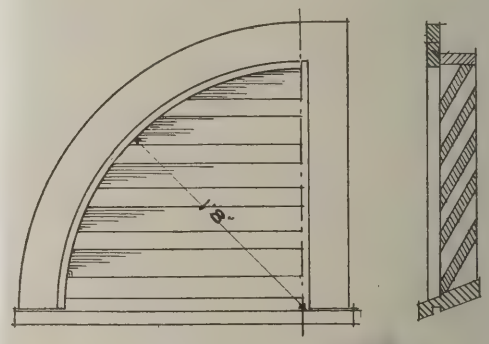
The interior trim throughout is of whitewood. The main stairs have whitewood strings and risers, oak treads $1\frac{1}{8}$ in. thick, birch balusters $1\frac{3}{8}$ x $1\frac{3}{8}$



Details of Dormer Construction and Base of Main Wall—Scale ¼ In. to the Foot



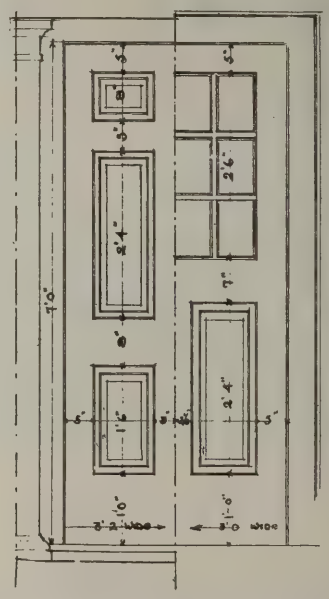
South or Sun Porch Elevation—Scale 3/32 In. to the Foot



Details of Louvres and Half-Louvres in Gable Ends—Scale ¾ In. to the Foot



North End Elevation—Scale 3/32 In. to the Foot



Half Elevations of Entrance Doors—Scale ⅜ In. to the Foot

three to a tread, and a birch newel. The treads were given one coat of stain filler and two coats of inside spar varnish. The rail, newel and caps were stained mahogany and were given two coats of varnish rubbed dull with pumice and oil. The cellar and back stairs are of North Carolina pine.

The floors in the living room, hall and dining room are double. A sub-floor of 7/8 x 6-in. North Carolina pine laid diagonally received heavy rosin-sized building paper, over which in turn was placed a parquet floor of 3/8-in. quartered oak, finished with pure white shellac.

The trim of this section of the house received two coats of flat white, one coat of zinc white and white enamel mixed, and one coat of white enamel, glass finish.

The living room fireplace is of pressed brick laid in white cement mortar. The hearth is of brick laid herringbone, with an oak border. The mantel is of whitewood and the terra cotta flue is 12 x 12 in. Two windows light the front while at the back small windows high up provide light from that direction.

The dining room has a panelled wainscot, the panels between the wainscot and the ceiling being of a light blue, as are also the window hangings.

The kitchen has a wainscot 5 ft. high consisting of King's Windsor cement, over which was applied a finishing coat of Keene's cement marked off into 6 x 3 in. spaces to imitate tile, the whole being given three coats of flat white and one coat of white enamel. The kitchen woodwork received one coat of stain filler and two coats of inside spar varnish. The cooking is done by a gas range.

The floors other than the living room, dining room and hall consist of a sub-floor of 7/8 x 2-in. rift yellow pine, which was given one coat of orange shellac and one coat of Elastic floor finish.

The bathrooms are similar, each having a floor of 1/4-in. hexagon ceramic tile with a 6-in. sanitary base. A wainscot 4 ft. 6 in. high consists of 6 x 3-in. glazed tile. Above the wainscot King's Windsor plaster, hard finish, was used. Each bathroom has a medicine closet with beveled mirror and movable shelves.

The house is lighted by means of electricity and is provided with a steam heating equipment. The boiler is an "American Ideal," and is covered with plastic asbestos cement applied in two coats to a thickness of 1 1/2 in. troweled to a smooth finish.



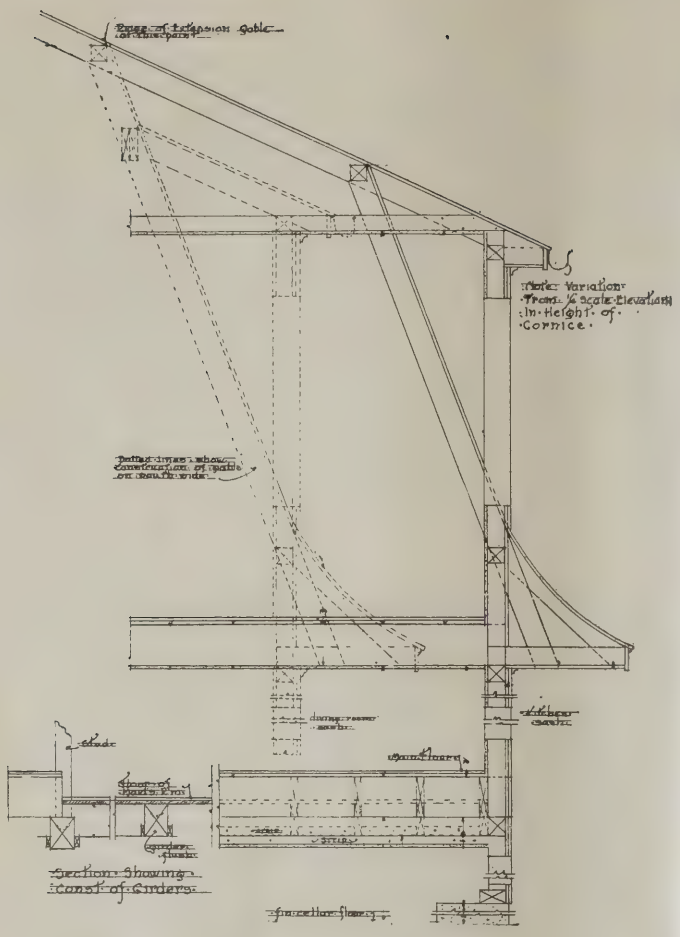
THE DINING ROOM, LOOKING TOWARD THE ENTRANCE TO THE BUTLER'S PANTRY

The first halftone illustration accompanying this article represents a view in the living room, showing at the left the cased opening to the hall and at the right the open fireplace, beyond which is the door to the sun parlor.

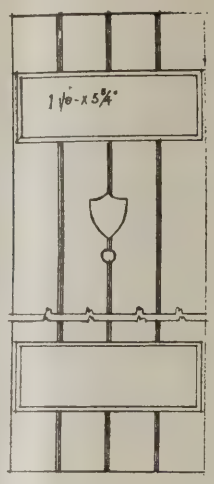
The three smaller halftones represent respectively a rear view of the house, the interior of the sun parlor and a detail of the entrance to the garage in the basement.

The illustration on this page is a view in the dining room looking toward the windows in the right hand wall of the house, and showing the double swing door to the pantry at the left.

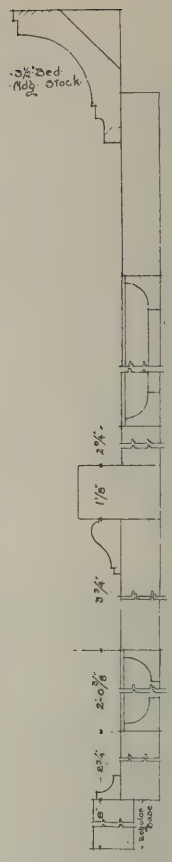
The residence here illustrated and described is



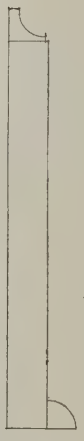
Details of Gable Construction—Scale ¼ In. to the Foot



Elevation of Batten Shutters for First Story — Scale ¾ In. to the Foot



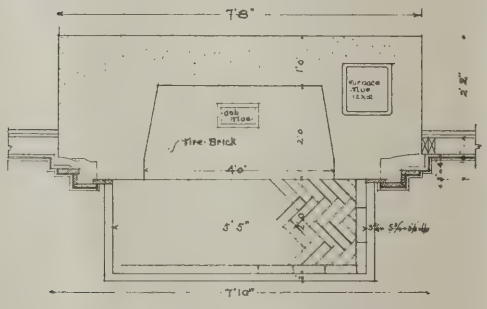
Vertical Section Through Dining Room Panelling — Scale 3 In. to the Foot



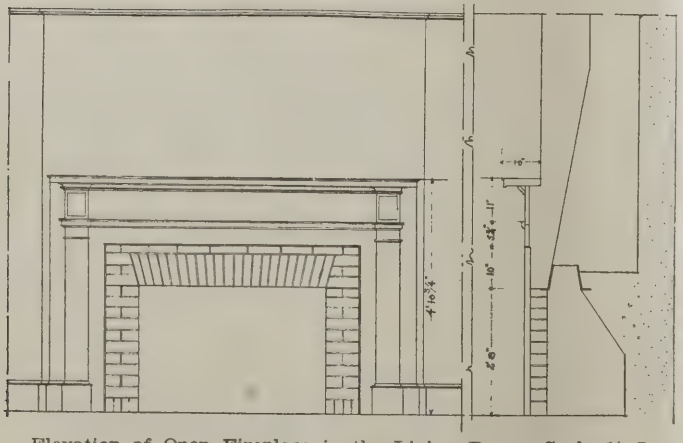
Base—Scale 3 In. to the Foot



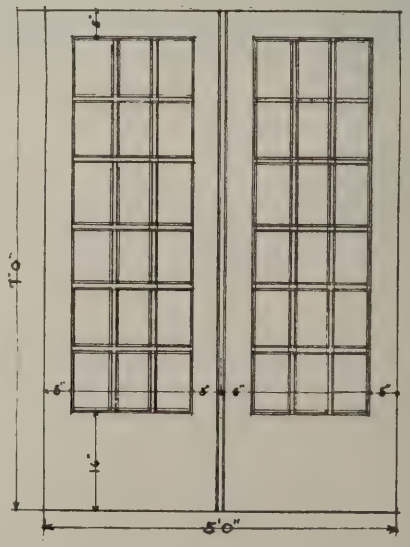
Cove Moldings of Front and Closet Door Trim—Scale 3 In. to the Foot



Plan of Open Fireplace in Living Room—Scale ¼ In. to the Foot



Elevation of Open Fireplace in the Living Room—Scale ¼ In. to the Foot



Elevation of Sash Doors to Dining Room —Scale ⅜ In. to the Foot

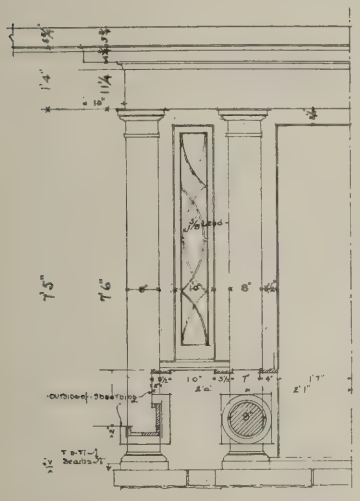
located at Pelham Heights, New York, and was built for Willard F. Clark, in accordance with plans and specifications prepared by Architect Lewis Bowman of Milligan & Company, architects and builders, 154 East First Street, Mount Vernon, New York.

PREVENTING JOINT MARKS IN STUCCO

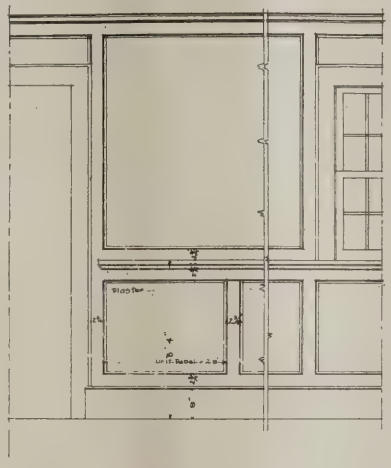
Observation of houses built of concrete blocks or tile and subsequently covered with stucco has shown that in many cases the joints between the units appear more or less distinctly, particularly after a rainstorm. With a view to showing the reason for this condition and taking precautions necessary to eliminate it, William M. Kinney, engineer of the Universal Portland Cement Company, stated in a discussion appearing in *Concrete* that this condition had not been observed where the stucco was three-coat work, but that it had been noticed in a number of cases where the exterior plastering consisted of a scratch coat and finish coat, particularly where a sand finish was used. He further said:

"An experienced plasterer in Chicago, who has done a large amount of stucco work, gives an opinion that this condition depends mainly on the relative density of the block or tile and the mortar joint; also workmanship and weather conditions during early hardening. The portions of the wall surface that are more porous than others will absorb water more readily from the scratch coat unless care is taken to soak the wall thoroughly beforehand. This results in a difference in density in the scratch coat and ultimately a permanent discoloration, which in two-coat work is very likely to show through the thin finish coat.

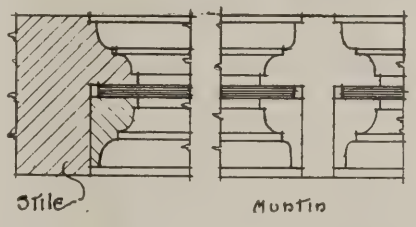
"If the block or tile be laid up in cement mortar, the latter will probably have the greatest density and consequently the joints will show light against the darker surface. If the block be dense and laid in lime mortar, the effect would be reversed. Should the weather be rainy, however, while the scratch coat is hardening, the markings may not show at all. This would be particularly true of the side of a building most exposed to the weather, which may account for the appearance of joint



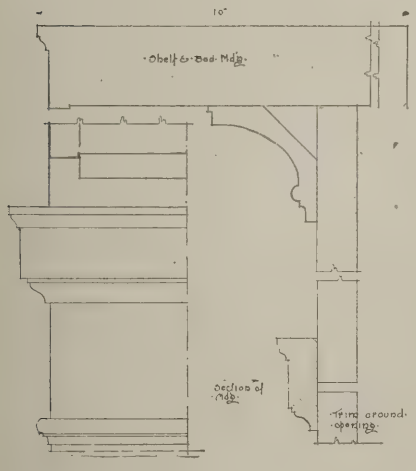
Details of Front Entrance—Scale ¼ In. to the Foot



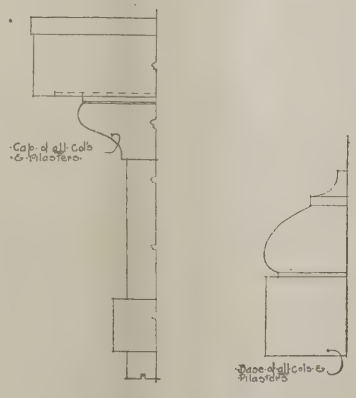
Elevation of Dining Room Skeleton Paneling—Scale ¼ In. to the Foot



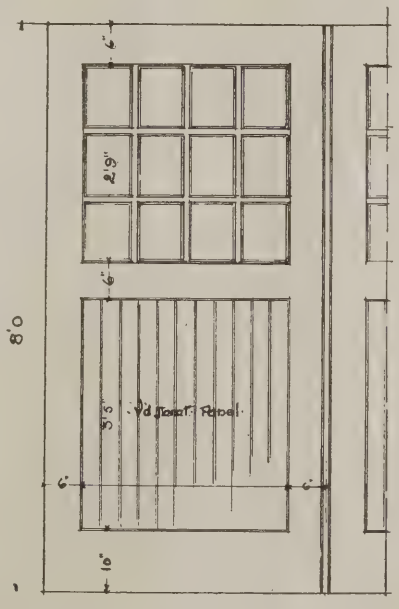
Details of Sash Doors to Dining Room —Scale ⅜ In. to the Foot



Details of Pilasters on Mantel—Scale 3 In. to the Foot



Details of Cap and Base—Scale 3 In. to the Foot



Elevation of Garage Doors 2¼ In. Thick—Scale ⅜ In. to the Foot

MISCELLANEOUS CONSTRUCTIVE DETAILS OF HOUSE SHOWN ON SUPPLEMENTAL PLATE

markings on several walls of a house where they may not appear at all on one side.

"This plasterer believes that the remedy is to allow the scratch coat to harden thoroughly before applying the intermediate or finish coat, preventing it from drying out by carefully sprinkling with water. In this way a surface of even density can be obtained and no joint markings will result. If the wall surface is thoroughly soaked with water prior to applying the scratch coat, it is not likely that the markings will appear, and, as already observed, the use of three-coat work is apparently another preventive."

HOME BUILDING IN A BOSTON SUBURB

Active building operations are now being promoted in sections of the Beacon Hill district, Boston, Mass., where many of the older houses date from the post-colonial period and these have influenced the architecture of the newer dwellings under construction.

Among the notable operations in this section is that recently completed at West Hill Place, on the Charles River embankment, and consisting of fourteen single houses and an apartment house, the work being done by Hoggson Brothers, New York, the architects being Coolidge & Carlson of Boston. These houses are constructed of brick over-burned in the kiln so that they have a dark mottled surface, gray in some parts and black in others. This brickwork is laid in black cement and trimmed with white marble. The entrance porches are on slender columns with entablatures delicately detailed and the doorways have fanlights with leaded sidelights.

The six houses are four stories high—four of them having their entrances on the Parkway, while the two central ones are entered from a short road leading into the circle. Around this circle are grouped eight houses, seemingly three stories in height but with the fourth story set back forming a terrace around the entire circle and permitting the sunshine to reach the lower windows of the opposite houses. Opposite the entrance road is an archway surmounted by brick pilasters and a stone entablature with the words "West Hill Place" in gold letters. This archway leads directly to Charles Street, where car lines to all parts of the city and to Cambridge are but one minute away.

HOUSE CONSTRUCTION IN NEW GUINEA

In Geelvink Bay, at Dorey, or Roonon, New Guinea, the regular dwelling is a long communal structure. These great "turtle-back" houses shelter from eighty to one hundred persons. They eat and sleep generally in a long corridor which runs lengthwise through the building, while on each side lead off small rooms, in which the private belongings of each family are stored.

The men lounge on the front piazza, often lying prone with spear or bow and arrow ready for any fish that may happen by. The women work on the back piazza nearest the forest-covered shore—convenient agents to spread the alarm should an attack be made by some tribe. The canoes are moored at the front of the house.

EXHAUST FAN FOR KITCHEN

One of the most useful applications of an electric motor about the household is the small motor-driven exhaust fan for the kitchen. Every one appreciates the need of a ventilating system for the kitchen. Any attempt to ventilate this room by opening the windows and doors is bound to fail, especially in the winter time. Many tradesmen who do electrical wiring are therefore in a position to extend their service to customers with profit.

Without the ventilator the odors from cooking will penetrate the entire house and linger in the rooms long after the meal itself is gone. The motor-driven exhaust fan consists, as the name suggests, of a small motor attached to a powerful fan. The device is mounted in an upper pane of a window, near the range, and well toward the top of the room. The motor is attached to the lighting circuit, and provided with a suitable snap switch for starting and stopping it. During the operation of the cooking the switch is turned and the fan forces out a steady stream of air, carrying with it all smoke, gases and odors.

ACTIVE INDUSTRIAL BUILDING IN NEW JERSEY

The building outlook for the present year in Bloomfield, N. J., and the surrounding towns is of an encouraging nature. Many important projects are under way, not the least of which is the new reinforced-concrete building that is being erected for the Sprague Electric Works by John W. Ferguson Co. of Paterson, N. J.

The main building, now rapidly nearing completion, is of reinforced concrete, 75 x 550 ft. in plan, with an "L" 75 x 179 ft., six stories in height, the walls of which are faced with brick.

In erecting this building the contractor used a center tower and two side towers, the latter being connected with the main tower by a Ransome chute. Sand and gravel were brought to the job by Pierce-Arrow trucks. A gravel incline was erected to lead to the point over the concrete mixers at the foot of the main tower. Here the sand and gravel were dumped through a grated floor into separating bins, thence passing to the mixer, while the cement was brought to this point on industrial cars.

One effect of the coal shortage situation in New York City is the discussion of heating buildings by oil and gas the coming winter. A trial equipment will be made presently of an oil system which statistics indicate can be used to advantage in boilers of apartment buildings.

BUILDING AGE

THE DEALER'S DEPARTMENT

WHAT IS THE DEALER'S TRUE FUNCTION?

SOME PERTINENT TRUTHS WHICH THE TRADE WILL FIND WELL WORTHY OF CONSIDERATION

IN the merchandising of any sort of goods it is entirely proper that selfish interest should determine policies within reasonable limitations. That the manufacturer sometimes goes beyond the reasonable boundaries which ought to limit his selfishness is a fact with which the average building material dealer, unfortunately, is altogether too well acquainted. Occasionally a manufacturer is short-sighted enough to regard the dealer merely as an avenue of distribution rather than as an *integral factor* in the process of distribution. The producer reasons:

"I am going to sell my goods to the consumer, and if the dealer doesn't handle them willingly I will force him to sell them; and if necessary I will force him to throw out my competitor's line of goods and carry mine."

Of course, the competitor usually reasons along the same lines, and the result is that numerous manufacturers are more or less constantly trying to use the dealer as a club to belabor competing manufacturers, to force the consumer to buy their goods, and in a variety of other ways to fight their battles for them. The battle which constantly wages around the dealer is a battle not only between competing manufacturers, but in the building material field it is even more intensively a battle between competing industries.

Probably the most interesting example of the difficulties that beset the retail merchant as a result of this sort of competition is to be found in the history of the retail lumber business of the last ten years. Any one whose business experience dates back two decades or more will recall that the lumber yard, so-called, of those days was just what its name implied—an establishment selling lumber, millwork, shingles and lath. In recent years the average lumber dealer has found it wise and profitable to take on many other lines of goods. He has realized that his own best interests lay in serving his community to the best of his ability, and with that idea in mind he has undertaken to sell many of the other commodities that are used in building. These goods he has handled with satisfaction to his trade and profit to himself, and until comparatively recently without arousing any particular antagonism. Only in the last four or five years has there been real war between the lumber industry and the manufacturers of such commodities as composition roofing, metal roofing and siding, metal lath, wall board, asbestos shingles, clay products, etc. Every dealer knows that these are all good commodities, that they all have their advantages for certain uses, and that none of them can hope to monopolize the market to the extreme detriment of any of the others.

The lumber dealer has found, however, that be-

A NEW FEATURE

With this issue "Building Age" inaugurates a department devoted to the interests of the retail dealer in building materials. This department will aim toward helpfulness in ways that will be measurable in more and better business for the dealer and better service for the consumer.

"Building Age" stands for ever better building — for heightening the standards of materials, workmanship and competition. It does not advocate any one material or group of materials. It is not the organ of any manufacturing industry. Consequently it is able to present in this new department a non-partisan publication for the dealer of a sort that has never before been attempted, comprehensive in scope and honestly devoted to the welfare and betterment of the retail merchant without regard to the special interests of particular industries. In this work "Building Age" has been pledged the active help of many of the men who stand foremost in the ranks of the country's best dealers.

"Building Age" extends to all dealers in building materials a cordial invitation to contribute their suggestions and criticism; to submit their problems for analysis, and in all possible ways to make profitable use of these pages.

cause he is known as a lumber dealer, some lumber manufacturers think he ought to sell lumber and nothing else. Of course that position is wholly untenable; as untenable as it would be for a manufacturer of drugs to assert that the retail druggist should sell nothing but drugs and chemicals, and should throw the soda fountain, the cigar counter, the household utilities section, the picture post card rack and all of the other miscellaneous appurtenances of the modern drug store out of his establishment. Most people remember the time when drug stores sold practically nothing but drugs and chemicals, but to-day in many drug stores one almost needs a guide to find the drug department, and in spite of the fact that many drug stores sell several times as many thousand dollars' worth of other merchandise as they do of drugs in a year's time, these establishments are still known as drug stores.

THE DEALER'S STOCK

The same development process has occurred with the lumber yards of most sections of the United States, and to-day the average dealer finds it wise to carry a stock of cement, some composition roofing, an assortment of asphalt shingles, a stock of wall board, sometimes a complete stock of masons' supplies, and a great many other products which are used in building. These things are carried in stock because the public wants them, and if the lumber dealer does not sell them he knows some one else will. They seem to be a legitimate and proper part of the stock of a normal retail lumber yard, as the business is conducted to-day. Every wide-awake retailer is anxious to sell all of these goods, and to sell them in as large quantities as possible, and consequently appreciates every effort the manufacturer may make to increase the demand, so long as that effort is not directed also toward forcing the dealer to abandon the sale of some other equally profitable product. In other words, from the retail standpoint, a little more constructive competition and a little less of the destructive kind would tend to improve the present situation. The big hammer has been used altogether too actively in connection with the marketing of building materials of late. The public's resentment and suspicion are the inevitable consequence of vicious competition between the industries that are turning out the various materials used in building.

The retail dealer in building materials may well scrutinize the new and untried commodity that comes to him without the test of time, and which he is asked to sell to his customers, not so much on the strength of its proven merit, as upon the strength of his reputation for square dealing and honest merchandising methods. But when any manufacturer or group of manufacturers makes an active effort to destroy the dealer's business in some commodity or line of goods that has stood the test of time, that is admittedly meritorious and, for some purposes, superior to other competing goods, then the dealer has real reason to resent such a policy.

Very clearly it is the dealer's function to sell the goods that the consumer wants—not the goods that some manufacturer or group of manufacturers would like to have him sell, unless that manufacturer or group of manufacturers has first convinced him of the merits of the goods offered, or has created a consumer demand. The retailer properly declines to be merely the manufacturer's puppet; his function is to serve his community, not to afford the producer a means of marketing goods that the community does not want. And the retailer is entirely within his right in choosing the lines which he will sell, and in refusing to handle those lines which, either because of lack of merit or lack of demand among consumers, cannot be sold with a reasonable margin of profit. Going still further, he is within his rights in refusing to handle lines of producers who undertake to dictate the management of his business; to undertake to tell him what goods he shall *not* sell, in addition to demanding that he shall sell *their* goods.

IMPORTANCE OF THE RETAIL DEALER

When the merchandising problem of the manufacturer of any of the principal commodities used in buildings is analyzed, it will be found that the retail dealer is the most important as well as the most independent factor in the whole situation. Without his willing and enthusiastic co-operation, no manufacturer can find a satisfactory market for his products. With that co-operation, the selling burden of the manufacturer is visibly lightened, and the difficulties of reaching the consumer are manifestly reduced; all of which, in the aggregate, demonstrates that some manufacturers could well devote themselves more directly to the promotion of their own business along constructive lines with less attention to ways and means of discrediting their competitors and their competitors' products. Add to this a more general appreciation of the fact that the building material dealer not only has the right to manage his own business in his own way, but is entirely competent to do so, and premises have been laid for material improvement in the sales promotion methods in use by many important manufacturers in this field.

We are officially informed that the lumber exhibit at the Building Exposition at the Builders' and Traders' Exchange headquarters, Detroit, Mich., has recently been augmented by a miniature cypress bungalow complete in all details, including the garage, porch chairs, swings, etc. The bungalow has been shown in various parts of the country and only recently arrived in Detroit, a special representative being sent along to set up the exhibit. The entrance to the exposition now shows a large electric welcome sign with the words "Building Exposition" blazing forth. Underneath the sign is a specially designed display of United States shields and flags.

THE BUILDING SITUATION AND THE DEALER

FEATURES WHICH DESERVE IN DETAIL CAREFUL CONSIDERATION — CO-OPERATION A NECESSITY

READJUSTMENTS in business are beginning to be felt. For the first time in many months a tendency to reaction is reported in the building industry. Time is demonstrating that we are not to have "Business as Usual." Business cannot be as usual. War is an unusual business, and the principal business of this country now is war.

While this is being written it appears that the two billion-dollar Liberty Loan has been oversubscribed. The aggressive campaign to place these bonds with the people has been accompanied by an assortment of erroneous ideas on false economy, which has had no other effect than to frighten people into a state of doubt regarding the future. Undoubtedly there is much in the situation which deserves careful consideration, and it may be well to discuss some of these features more or less in detail.

The successful flotation of the Liberty Loan has relieved the banks of the necessity of tying up a large part of their credits, which would otherwise have been necessary. These credits have been conserved for use in the regular channels of business, such as loans on new enterprises, real estate improvements, etc. The bonds have been taken up by investors who have been urged to participate out of current earnings. This is as it should be.

THE "LIBERTY LOAN" AND BUSINESS

The two billion dollars thus made available to the Government will be an enormous stimulant to business activity. For the immediate present, however, the soaking up of such a tremendous amount of money, along with the still rising cost of living and the preparations for meeting the proposed heavy taxes have had the effect of curtailing to some extent the buying of luxuries.

We are hearing a great deal these days about economy from every conceivable source. Extravagance is always offensive. It cannot be justified on the theory that it "makes work." At this time the world does not need work made for it. The most important problem of society to-day is to save work and to make it more effective in supplying a greater amount of goods for all. This ought to be clear. Suppose one thousand men were employed in the production of a luxury, and suppose one thousand *more* men were needed in the production of a necessity, say raising potatoes. Could anything but good come of diverting that labor from the production of a luxury to the production of the necessity? On the other hand, it is important that the American standard of living should be maintained. Furthermore, the system upon which society is based at present concedes stratification—layers of varying standard. For each class a distinct line may be drawn between luxury and necessity, but the distinction between classes is by no means easy to define. One can readily see then that luxury and necessity are relative terms. Clothing of fine texture is a luxury for the working man. It does not serve his purpose so well as those of coarser weave made to wear longer. To demand that higher classes of society use these same garments would be to inflict a hardship of doubtful utility. Any radical change in the standard of living would be accompanied by disturbances in business which would have far-reaching effects. The real danger lies in producing unnecessary things.

BUILDINGS A NECESSITY

No lengthy arguments are necessary to demonstrate that buildings in a civilized community are a necessity. Even the maddest of our "economy-at-any-price" advocates must admit that the increased demands along these lines must be met to some extent. It is the unnecessarily elaborate residences which must eventually make way for the insistent demand for suitable homes for the great army of workers now earning larger wages than ever before in the industrial history of this country.

Up to the present the building industry has participated in the general business activity of the country. The reported tendency to reaction is attributed to hesitation by investors on account of the

High prices of material,

Increased cost and uncertainties of labor, and

Lack of confidence in business conditions, due to this country's entrance into the war.

Apparently these are sufficient to make the average man "stop, look and listen." But let us dig a little under the surface.

The price of steel products has undoubtedly advanced with prodigious strides, but other building materials have not followed in any such ratio. What increases there have been are principally due to the higher cost of labor which has entered into their manufacture.

THE LABOR SITUATION

The labor situation in the building industry is not as yet acute. Labor unions have subsided for the time being, and most of them have committed themselves to refrain from-strikes during the war period. The Government is making some impression on the floating supply of labor, but no real shortage is reported as yet, although future developments may necessitate a larger demand from this source.

Wages have not increased out of proportion to the general advance in other lines, and it is a well-known fact that once advanced they are not easily reduced. Wages will continue high for the next few years at least.

At the time of writing the Interstate Commerce Commission is still deliberating on the freight rate increase. Those closest in touch with the proceedings are anticipating the granting of a considerable part if not all of the 15% asked for by the railroads. This will necessitate an appreciable increase in the price of such bulky materials as lumber, for example, where the freight already enters into its cost as a large factor, especially where the hauls will be long.

TREND OF PRICES

The trend of the market is still upward, and no considerable drop in prices is likely for some time to come. The "long-headed" business man has reconciled himself to the fact that the value of the dollar has been permanently reduced. Those who look for relief in this direction may be disappointed.

To what extent the lack of confidence in future business conditions is justified may be determined from an investigation of conditions following our own Civil War. Starting from a period, shortly preceding the end of that unfortunate conflict this country entered into a business boom which did not terminate until the panic of 1873, and then only because of lack of foresight. The creation of the Federal Reserve, with its wonderful machinery for the contraction and expansion of credit, will guarantee us against a repetition of the occurrence.

We have entirely departed from the principles which heretofore have governed American banking. Fomerly credits were absolutely limited by cast iron reserve requirements. How badly the old system worked was demonstrated by the panic of 1907 when the sudden check administered to the over-extended credits threw the nation's business into a state of chaos. The banking reserves of the nation are now concentrated under the control of the Federal Board, and the able manner in which their work has been prosecuted up to the present has inspired the confidence of the entire banking world.

WEALTH OF THE COUNTRY

At the close of the Napoleonic Wars the total wealth of the United Kingdom was less than twelve billions and its debt approximately four and one-third billion. America stands to-day with a population of over one hundred million, a national wealth of two hundred and fifty billion, and an annual income of forty billion of dollars. She is financially and industrially robust, and well equipped to stand any probable shock to her resources. Our country is so big and rich and resourceful that no great apprehension need be felt regarding its economic future. A little more conscious belief in its opportunities will save us from the absurd notion now abroad in the land that our prosperity is bound up with an artificial, wasteful and transient war trade.

At present the country continues in a state of industrial and agricultural prosperity. High wages and enormous profits for farmers and industrial enterprises are reported from all parts of the nation. On account of the large influx of population into industrial centers many cities still report an insistent demand for suitable homes. Due to the increased requirements for agricultural purposes, land is increasing in value. The home builder now finds a competitor in the field, and all signs point to a continuation of this tendency. There is at the present time more money in circulation in this country than ever before, and rentals are reported as being much higher with a firm upward trend. Taking everything into consideration, it would appear that now is as good a time as any to undertake building operations.

Undoubtedly the dealer has a duty to perform. He must first convince himself that legitimate building operations should not be hampered at this time. The building business has sustained some damage as the result of the activities of the false economists and calamity howlers, but it is not too late to repair that damage. All that is necessary is co-operation. The aggressive dealer will talk it over with his friends and business acquaintances and get in touch with the editor of his local paper, urging the editor to spread the propaganda of optimism. Building should proceed on as nearly a normal basis as is possible consistent with the necessities of giving precedence to war work and providing men for the work of war.

THE CAR SHORTAGE

In an address delivered before the National Editorial Conference of the Business Press at Washington, D. C., May 25, Howard Elliott of the New York, New Haven & Hartford Railroad and a member of the Railroad War Board, discussing the car shortage question and what he regarded as the real reasons underlying the inability of the railroads to handle the freight offered, said:

"Car shortage perhaps is a misnomer, though it is not a misnomer where the shipper is concerned, because he is not getting all the cars he needs. But it is a misnomer in that the failure of the railroads to supply cars is due not so much to the non-existence of enough cars, as to the fact that the railroad system is overtaxed as a whole because of lack of terminals, lack of sidings, lack of modern appliances on some of the railroads, and lack of modern appliances by shippers and receivers of freight in some places, so that the maximum use of each car is not obtained.

"These facilities have not been added to to the extent to which they should have been in the last five or ten years. Those of us who have been in the railroad business a long time have preached for years that the country, for its own interests, ought to permit the railroads to spend at least a billion dollars a year in new additions. The country has not permitted us to earn enough to spend a billion dollars and our plant is not all that it should be."

USING GOVT. BULLETINS AS SELLING AIDS

A BRIEF DESCRIPTION OF A FEW OF THE GOVERNMENT BULLETINS AVAILABLE FOR THE DEALER

BUSINESS men are not as generally cognizant as they should be of the fact that the Government of the United States is the largest publisher of business and technical literature in the world, and that the results of investigations and research work by thousands of government experts are constantly being made available for practical use and application through the Government Printing Office.

Hardly any phase of American business can afford to ignore the material that issues out of that mammoth establishment at Washington, but it is unfortunately true that few business men realize fully the possibilities of practical use of the great library, of splendidly informative publications which is placed at their disposal by the Federal Government.

A casual examination of some of the catalogs issued by the Government affords many suggestions as to many ways in which dealers in building materials might utilize official publications as means of stimulating the demand for the materials they are selling, incidentally advertising their own business in a most effective way. An investment of $5 plus a little postage will enable any dealer to send to one hundred customers or prospective customers that number of Government publications dealing with some subject, the arousing of interest in which is bound to stimulate the demand for construction material. These publications are obtainable in large or small lots, most of them at five or ten cents a copy, and the very fact that they are issued by the United States Government gives them a degree of standing which would not be accorded to ordinary advertising literature, even though it might be based upon equally sound investigations by equally competent authorities. The price which the Government charges for its publications is intended merely to cover the cost of their mechanical production and sale, contributing nothing toward the expense of maintaining an army of experts who are engaged in analyzing all sorts of business and scientific problems.

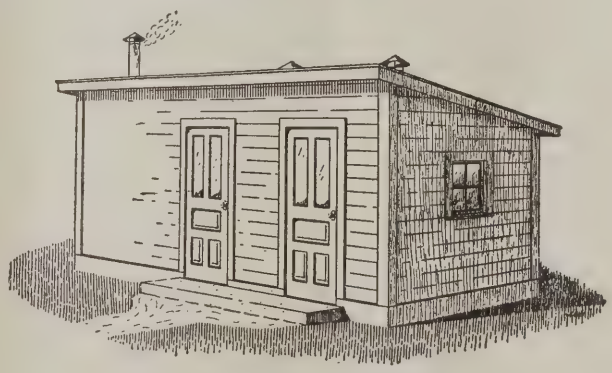
It is the purpose of this article to take a few of the publications of the Department of Agriculture as examples, and to show how dealers in building materials may profitably utilize such publications as means of stimulating business, and at extremely low cost. Any dealer can obtain these publications from Washington and distribute them to his prospective customers, with the assurance that in most instances the recipients will not only find real interest in this novel method of advertising, but, moreover, that it will actually tend to stimulate the sale of building materials.

The dealer who is in the habit of spending money each year for calendars or other like advertising matter will find in some of these publications issued at Washington material that he can distribute with much greater beneficial effect, matter that will be of more practical value to customers and that will receive much more respectful attention than any privately prepared and printed advertising literature.

The publications here reviewed are all issued by the United States Department of Agriculture, and are obtainable from the Superintendent of Documents, Washington, D. C., at the prices indicated.

A DAIRY HOUSE PLAN

Farmers' Bulletin No. 689, entitled "A Plan for a Small Dairy House," is the work of Ernest Kelly, dairyman, and Karl E. Parks, dairy engineer in the Dairy Division of the Bureau of Animal Industry. It is a four-page pamphlet, with four illustrations, including a perspective view, a cross



PERSPECTIVE OF DAIRY HOUSE

section and a floor plan of an inexpensive sanitary dairy house, the character of which may be judged from the following brief extract.

The building illustrated herewith is 20 ft. long, 10 ft. wide, 8 ft. 6 in. high in the front, 6 ft. 6 in. in the rear, and has a shed roof. The exterior of the building may be covered with sheathing and building paper or with weatherboarding and shingles, the deciding factors being expense, durability and appearance. The interior, however, should be carefully finished, so that the walls and ceiling may be smooth and free from corners or projections on which dust or dirt may accumulate.

The building should have a good concrete floor, pitched to drain through bell traps. The side walls as high as the window should be plastered with cement on metal lathing. The remainder of the walls and ceiling may be covered with matched boards and then painted with a white, washable, enamel paint. Ventilating flues should extend through the roof from the ceilings of the cooling room and wash room. The

windows should be hinged, as shown in the drawings (see Fig. 3), and set to be flush with the inside wall when they are closed.

It is not likely that this plan in its entirety will exactly fit the requirements of the average farmer, but it presents in definite form a suggestion which, if placed before one hundred farmers whose profits would be materially increased by the addition of such dairy houses to their present equipment would undoubtedly be productive of some opportunities to sell the material needed in such construction. The price of Farmers' Bulletin No. 689 is five cents.

A STIMULUS TO SILO BUILDING

A much more pretentious publication is Farmers' Bulletin No. 589, entitled "Homemade Silos." It is the work of Helmer Rabild, A. K. Risser and K. E. Parks of the Dairy Division, Bureau of Animal Industry. It contains a brief review of the history of the silo, and explanations of the three common types, the concrete silo, the stave silo, and the modified Wisconsin silo, with a tabulation showing the average costs of these types and some comment on less commonly used types of silo construction.

Definite statistics are furnished, showing the silage consumption of various kinds of stock, thus enabling the prospective silo builder to determine the actual size which will be required to meet his conditions. Then is presented a detailed and carefully worked out set of instructions for the building of concrete silos of three types—those of concrete blocks, concrete staves and the monolithic type, following which are equally comprehensive instructions for the building of a stave silo. The following extract will illustrate the usable character of the information given on the building of the stave silo:

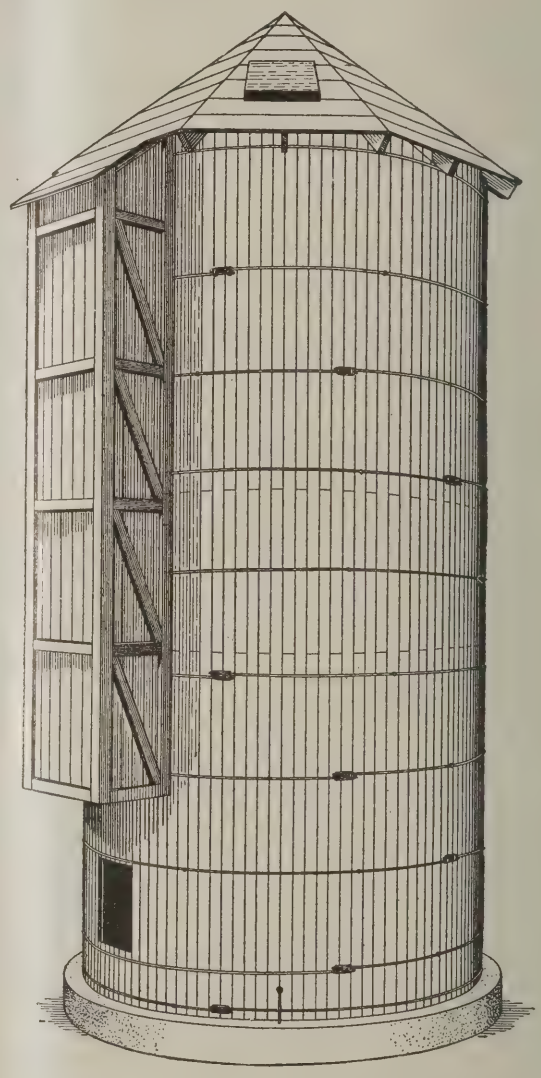
Laying Off the Foundation—Remove any grass or rubbish which may be found at the site of the silo wall and smooth the surface of the ground. Drive a stake firmly in the ground at the center of the proposed silo. Saw off this stake at the height desired for the foundation wall, which should be at least 1 ft. above the surface of the ground. One end of a straight 2 by 4 in. scantling, a little longer than is necessary to reach from the center of the silo to the outside of the foundation wall, should be nailed on top of the stake with a 40d spike. This spike then marks the exact center of the silo. From it measure on the scantling the distance to the inside and outside of the foundation wall and, having nailed markers on as shown, lay off the foundation. The inside of the foundation wall should be 6 in. nearer the center of the silo than the inside of the staves.

Where the ground on which the silo is to be located is not level, the markers can be lengthened by holding a longer board against either marker, moving it up or down to keep it touching the ground, but care must be taken that the scantling is held level.

The Staves. Lumber—Cypress, long-leaf pine, white pine, cedar and California redwood are good materials for stave silos. It is important that the staves be straight and free from sapwood, loose knots and waney edges.

Preparing the Staves—Staves should be made of 2 by 4 in. or 2 by 6 in. scantling, the latter being preferable, particularly for the larger silos. They should be of the same width and thickness and should be dressed on all sides, the edges being left square. It is considered necessary by some that the edges of the staves be tongued and grooved, but satisfactory results can be obtained by using square-edged staves, and at less expense.

After the staves are squared at the ends, holes should be bored in the edges from 4 ft. to 6 ft. apart with a ½-in. bit. These holes are made on one edge only of each stave, and must not be in line in adjoining staves. They should be about 1 in. deep in staves 4 in. wide, and about 3 in. deep in staves 6 in. wide. One of these holes should come within a foot of each end of the stave, Bore the holes perpendicular to the edge of the stave, to avoid having the silo thrown out of plumb. The purpose of these holes is to allow spiking the staves together when set up. The spike is driven to the bottom of the hole, and passes through the rest of that stave and into the adjoining stave, as shown in



COMPLETE SILO WITH CHUTE

Fig. 20. Care should be taken not to put any spikes in those portions of staves which are to be cut out for doors.

Bulletin No. 589 contains 47 pages, with 37 illustrations, and costs five cents. Any dealer can distribute this bulletin to one hundred farmers who ought to own silos at an aggregate cost of $6, including the postage for mailing, can put his imprint on every copy of it mailed, and can, if he

chooses, follow it up a month or so later with an equal number of copies of Farmers' Bulletin No. 578, which will serve to clinch the interest in the silo question aroused by bulletin 589.

Farmers' Bulletin 578, entitled the "Making and Feeding of Silage," is a twenty-four-page publication treating five phases of the silage question. These subjects and the authors are: "Making and Feeding Silage," by T. E. Woodward of the Dairy Division, Bureau of Animal Industry; "Silage for Dairy Cattle," by the same author; "Silage for Horses," by George M. Rommel, Chief of the Animal Husbandry Division; "Silage for Beef Cattle," by W. F. Ward, Animal Husbandman in Beef Cattle Investigations; "Silage for Sheep," by E. L. Shaw, Animal Husbandman in Sheep and Goat Investigations. As an example of the really valuable information it contains, consider the following extracts from the suggestion of "Silage for Horses":

Silage has not been generally fed to horses, partly on account of a certain amount of danger which attends its use for this purpose, but still more, perhaps, on account of prejudice. In many cases horses have been killed by eating moldy silage, and the careless person who fed it at once blamed the silage itself, rather than his own carelessness and the mold which really was the cause of the trouble. Horses are peculiarly susceptible to the effects of molds, and under certain conditions certain molds grow on silage which are deadly poisons to both horses and mules. Molds must have air to grow and therefore silage which is packed air-tight and fed out rapidly will not become moldy. If the feeder watches the silage carefully as the weather warms up he can soon detect the presence of mold. When mold appears, feeding to horses or mules should stop immediately.

It is also unsafe to feed horses frozen silage on account of the danger of colic. This is practically impossible to avoid in very cold weather, especially in solid-wall silos. By taking the day's feed from the unfrozen center of the silo and chopping away the frozen silage from the edges and piling the frozen pieces in the center the mass will usually thaw out in time for the next feed.

Corn to be made into silage for horses should not be cut too green, as sour silage will result and may cause colic when fed. The corn should be well matured and cut when the grain is beginning to glaze. The silo should be filled rapidly and the corn should be vigorously tramped and packed while filling. At least three men should be inside the silo, moving constantly, two around the edges and the third across and around the center. This is by far the most important point in connection with feeding silage to horses, and the lives of the horses fed on silage may depend on the thoroughness with which the tramping is done. If properly done no danger is likely to result; if not properly done air pockets may form and cause the accumulation of a small mass of mold which the feeder may overlook but which might be sufficient to kill one or more horses.

The value of silage for horses is greatest as a means to carry them through the winter season cheaply or to supplement pasture during drought. As the danger of mold is greater in summer than in winter, silage should not be fed to horses in that season unless a large number of animals are getting it, and the daily consumption is so large as to preclude the formation of mold on the surface.

This Bulletin sells for five cents a copy, and ought to be in the hands of every farmer who either owns or contemplates building a silo. The dealer who is interested in developing silo trade will find that the distribution of copies of Bulletins 589 and 578 will arouse real interest among farmers who have not quite been converted to the need of silos—interest that will result in sales.

A BIRD HOUSE BOOK

For the building material dealer, particularly the lumber dealer who is catering to a considerable amount of city or town as well as country business, Farmers' Bulletin No. 609, "Bird Houses and How to Build Them," affords splendid advertising material. This publication consists of 19 pages, with 48 diagrams and illustrations. It suggests the construction of many classes of bird houses in nearly all of which lumber is used, and specific lumber diagrams like the one here shown are given in numerous instances. In the case of this publication, the material used would not run into a quantity involving profitable sales, and consequently the use of this publication as a means of advertising may properly be regarded as a method of building up good will among customers and prospective customers rather than as a means of stimulating immediate business. Nearly every one who has a comfortable home where there is room enough is interested in maintaining one or more bird houses, and the protection of birds is particularly important this year because of the important work they do in destroying insects and protecting growing crops against insect attack.



INTERIOR VIEW OF PIGEON PEN

The average dealer will find among his customers or prospective customers a considerable number of people who are interested or might be interested in squab raising. To such, Farmers' Bulletin No. 684, "Squab Raising," by Alfred R. Lee, Animal Husbandman in Poultry Investigations, Bureau of Animal Industry, would prove decidedly interest-

ing as a practical and non-technical treatise on the raising of squabs for profit. The distribution of this publication could hardly fail to have the effect of stimulating the demand for material, as will be seen from the following extract descriptive of the buildings required for the successful raising of squabs.

The prime essentials in pigeon houses are fresh air, dryness, sunlight and space enough to keep the pigeons comfortable. The location should have good water drainage and air circulation in order that the floor and yards may be dry, while it should be situated for convenience in management. A southern or southeastern exposure is best. The general principles of construction which apply to poultry buildings also apply to pigeon houses. Almost any style of house can be used for pigeons, and in many cases where only a few pigeons are kept, available buildings, such as the lofts of barns and vacant poultry houses, can be fitted up at a small cost.

A gable-roof building 10 ft. to 15 ft. wide, 6 ft. from the floor to the eaves, and 8 to 9 ft. to the ridge makes a good pigeon house. If a large part of the roof slopes toward the south, the house is apt to be too hot during the summer. This house can be made any length desired, but it is not usually considered advisable to keep over 400 pairs of breeders in one house. A pen 8 by 9 ft. will accommodate 25 pairs of pigeons, while 40 pairs may be kept in a pen 8 by 13 ft. The necessary floor space to allow per pair varies from 2½ to 3 sq. ft., according to the size of the pen, as a pair of birds requires less floor space in large than in small pens. From 20 to 75 pairs of pigeons may be kept to advantage in each pen. It costs from $1.25 to $1.75 a pair to construct pigeon houses, including interior fittings and a small outside pen or flyway.

The house should be tightly constructed on all sides to prevent any drafts. More open and less expensive houses may be built in warm than in cold climates, but the house must be comfortable in cold weather. The number of squabs produced in winter in cold climates may be increased somewhat by heating the pigeon house, but this expense does not pay under average conditions in the United States. Windows should make up about one-tenth of the front of the house and should be arranged so that they can be taken out during warm weather. One window in each pen may be replaced by a muslin curtain in cold weather for ventilation when the house is shut. The windows should be placed just below the eaves to allow the sun to shine well back into the house.

Pigeon houses should be constructed so that they can not easily become infested with rats. This is usually accomplished by building the house from 12 to 24 in. above the ground, using board floors and boarding up the space between the ground and the floor, but leaving small doors so that cats and dogs can get under the house. If floors are built several inches above the ground they should be double, with building paper between the layers, except in the southern part of the United States. Alleyways 2½ to 3 ft. wide are usually built on the north side of pigeon houses which contain more than two or three pens. The pens are arranged to open into the alley so the attendant will not disturb the pigeons any more than is necessary in going through the house. Alleys increase the capacity cost of the house and are considered an unnecessary expense by some pigeon raisers.

This publication consists of 16 pages, with 9 illustrations, and sells for five cents a copy.

MATERIAL FOR THE POULTRY FARMER

Another bulletin along somewhat similar lines is No. 624, "Natural and Artificial Brooding of Chickens," by Harry M. Lamon, Senior Animal Husbandman In Poultry Investigations, Bureau of Animal Industry. This is a fourteen-page bulletin with ten illustrations, containing much practical information for any one who is interested in raising chickens and shows the right and wrong ways to construct brood coops. It sells for five cents a copy.

WEEDS AND HOW TO CONTROL THEM

Many city people as well as farmers would be much interested in Farmers' Bulletin No. 6660, entitled "Weeds and How to Control Them," by H. R. Cox, Agriculturist in the Office of Farm Management. This is a 32-page bulletin, with 27 illustrations and an appendix containing a list and description of the fifty worst weeds found in the United States. It affords practical directions for getting rid of weed pests of various kinds, and while it contains no suggestions that would lead directly to the use of building material, its perusal would be of practical benefit to many customers and prospective customers, and its distribution can therefore properly be considered as good advertising for the dealer who is desirous of building up good will in his community.

Every dealer who numbers some farmers among his customers can probably make use of Farmers' Bulletin No. 602, the "Production of Clean Milk," which, in addition to affording important information to milk producers, is intended also to be of interest to consumers who are desirous of obtaining pure milk. It treats extensively of sources of milk contamination and affords detailed directions as to the means the dairy farmer should adopt to insure the production of the cleanest and purest possible milk. In this connection, it affords important suggestions upon dairy barn construction and on the design of milk houses. Instructions for pasteurizing and for the design of home-made cooling tanks are also included. Any dairy farmer who reads this publication will gather from it ideas that he is very apt to utilize in improvements to his plant, which, of course, mean opportunities to sell building material. Bulletin No. 602 sells for five cents a copy.

PUBLICATIONS DEALING WITH FARM MANAGEMENT

Every dealer catering to the farm trade has among his customers or prospective customers some farmers who are interested in the theoretical as well as in the practical side of agriculture. The measure of public respect for the application of scientific principles to farming is rapidly increasing. Consequently, many dealers can capitalize in the way of increased good-will and acquaintance, the distribution of such publications as Farmers Bulletin No. 511, "Farm Bookkeeping," by Edward H. Thomson, Agriculturist, Office of Farm Management, Bureau of Plant Industry, and Bulletin No. 572, "A System of Farm Cost Accounting," by C. E. Ladd, Agent of the Office of Farm Management.

The former of these publications contains detailed instructions for the opening of a practical

set of books, with forms for inventory, cash accounts, profit and loss statements, etc. It is a 40-page publication, selling at five cents.

Bulletin 572 is the outgrowth of a system of farm cost accounting which was developed by Prof. G. F. Warren of the New York State College of Agriculture, and used on his own farm over a period exceeding seven years. It is a simple elucidation of the principles of cost accounting as applied to farming, contains sixteen pages, and costs five cents a copy.

For the farmer who is interested in the theory of agriculture, Bulletin No. 259, of the Bureau of Plant Industry, entitled, "What is Farm Management?" contains much valuable information. This bulletin is by W. J. Spillman, Agriculturist in Charge of the Office of Farm Management. It is a publication of somewhat elaborate character, eighty-four pages and cover, deals in considerable detail with the theory of farm management, with such subjects as hired labor, the farm work schedule, managerial efficiency, etc. It is a publication the general distribution of which by dealers would not be advisable, but one that would be of interest to a few of the better class farmers in almost any locality. It sells for ten cents a copy.

HELPING TO SWAT THE FLY

For general distribution during the summer, when flies are a problem and a pest, Farmers' Bulletin No. 679, "House Flies," by L. O. Howard of the Bureau of Entomology, and R. H. Hutchison, Scientific Assistant, affords dealers an opportunity to do some really useful publicity work. This bulletin, bearing the dealer's imprint, will be received with interest and appreciation by almost every one to whom it is sent, since it contains not only detailed descriptions of the various types of flies which are obnoxious for their disease-carrying traits, but also gives practical suggestions as to means of destroying them and preventing as far as possible their propagation. This is a 24-page booklet selling at five cents a copy.

Another somewhat similar publication of general interest, and one which any dealer can use as a means of good-will advertising, is Farmers' Bulletin No. 658, "Cockroaches," by C. L. Marlatt, Entomologist, Department of Agriculture. This bulletin contains entomological descriptions of all of the common varieties of roaches and detailed directions for destroying them. This also is a 16-page booklet selling at five cents a copy.

POINTERS ON TREE SURGERY

In every community where trees are abundant the problem of conserving diseased and storm-damaged trees is constantly present. Tree surgery, so-called, is a science with which the general public has altogether too little acquaintance. Consequently, the enterprising dealer will find that many people on his mailing list will appreciate a copy of "Practical Tree Surgery," by J. Franklin Collins, Forest Pathologist of the Bureau of Plant Industry. This is a forty-page publication, with numerous halftone illustrations showing the right and wrong ways of handling and curing injuries to trees, and including, among other things, detailed directions for removing decayed branches and excavating decayed portions of trunks, methods of bolting and tying trees that have been weakened by decay or storm damage, the use of Portland Cement for filling cavities, etc.

"Practical Tree Surgery" sells for ten cents, and contains enough information to enable any person to give invalid trees expert treatment and care.

HOW THE DEALER CAN USE THEM

The publications that have been described are but a few examples taken at random of those that are obtainable from the Federal printeries at nominal cost. The enterprising dealer who has exhausted the more commonly used means of attracting attention to his business can use these and many other government publications, having his imprint prominently placed on them by his local printer or rubber stamping them as he prefers, with the assurance that the material he is distributing is of the sort that can not fail to prove valuable to those who receive it, and that consequently will be sure to arouse their appreciation, good will and that cordial attitude which is so important an asset to the success of a retail business.

The dealer who does not wish to make use of this kind of material in large quantities, but who prefers to offer free copies of these bulletins in his advertisements, can describe the publications which he is prepared to send to inquirers either in letters to his entire trade list or in his newspaper advertisements. In either case the offer of these publications free is sure to result in a considerable number of replies, since it is a fact, unfortunate as it seems, that most of these Government publications are quite unknown to the great majority of people.

EXCELLENT BUSINESS-GETTING ADJUNCTS

In these and in numerous other ways that will readily suggest themselves to the enterprising dealer, the Government Printing Office can be made a splendid advertising and business-getting adjunct with very little expense to the user.

Dealers who are interested in obtaining copies of these or other Government publications, can secure from the Superintendent of Documents, Washington, D. C., complete catalogs of the publications of the various departments and bureaus in which they are interested. These catalogs are published for free distribution, and afford a key to every obtainable Government document and its price.

CANADIAN LAW RECOGNIZES DEALERS' RIGHTS

In connection with the application of the Federal and State laws regulating business, it has been the almost universally accepted policy in the United States to regard any active effort toward maintenance of the exclusive right of the retail merchants to buy from wholesalers and manufac-

turers as unlawful, and retailers have been forced to depend largely upon established trade customs rather than upon any legal recognition of their rights for protection against unfair practices by manufacturers and wholesalers who seek to do a direct-to-the-consumer business and at the same time to sell to the retail trade.

In this connection, special interest attaches to an order issued some time ago by the Canadian Government intended to prevent undue increase in the cost of necessaries. This order provides that it shall be unlawful for any person to hold any unnecessary supplies beyond an amount reasonably required for his own use or for the ordinary purposes of his business, and also prohibits the withholding from sale by wholesalers, jobbers and retailers of stocks of necessaries in excess of their ordinary business requirements, but contains the following striking proviso:

"Nor shall any manufacturer, wholesaler or jobber, because of anything herein contained, be under obligation to sell to other than such class of persons as are accustomed to purchase from manufacturers, wholesalers or jobbers, respectively; nor shall any person be under obligation to sell otherwise than in accordance with the ordinary course of business."

This constitutes governmental recognition of the dealer's right to protection against the direct competition of manufacturers and wholesalers—recognition of a sort that might well be emulated by the Federal and State authorities of the United States. While there is nothing in this Canadian order that specifically brands as unlawful the unfair competitive practices to which many manufacturers and jobbers are addicted, it is very clearly the policy of the Canadian Government at this time to afford the dealer a reasonable measure of protection, and even under the abnormal war conditions prevailing in the Dominion to maintain the integrity of the normal business structure and to prevent unscrupulous business men from urging the war as an excuse for violating what have come to be established trade customs and principles.

THE POINT OF CONTACT

"Not long ago," said a dealer to a representative of BUILDING AGE, "a fellow who handles building material in a town near us drove through and stopped off and had a talk about business in general and ours in particular. He was kicking like a young steer, and the thing that seemed to be his chief sorrow was that the line we have to handle now covers so many things. He was sighing for the good old days when all he had to monkey with was lime and lumber.

"I didn't know just what to say to him at the time, because I am one of those yaps who would be fine in an argument if he could have until next day to answer. So when he compared conditions now, when a dealer in building material carries about as many different kinds of things as a dry goods store, with the good old days, I was even a little inclined to think that maybe he was right after all. But after he had driven off I started to thinking about it, and it seemed to me that he had overlooked one important point, and that is this: that a successful business is merely a matter of point of contact, of getting into touch with the people of your community as much as possible, with as many people, and as many times, as you can.

"If a blacksmith announces that he would do nothing but shoe horses, then nobody but a horse owner would take any interest in him. But the more useful things he can do, the more people he can reach. It isn't any different with the dealer. When he sells a little roofing, or a ventilator for a barn, the important thing isn't merely that he has made a profit on those things, but that he has sold the article to a man who some time will want a bag of cement or a hardwood floor, or maybe a whole house bill.

"So I am ready and willing to handle any old thing that the public will buy if it fits into the building material line and will bring me into contact with more of the builders of my town. It may increase my investment a little, but I would be a bum merchant if I didn't soon know enough about the demand to keep from getting overloaded or stuck with something that won't sell.

"I want it understood that this is a building material business from A to Z, and if it is building material they want, here it is. I especially want the people to know that they can be sure to find right here the standard advertised brands that they read about. I figure that every time you send a man away disappointed, some fellow who thought for sure that you would have what he wanted, that you have given yourself a black eye.

"And there is another phase of it that may seem a little sentimental, but that I think is worth considering. I believe that it is a good thing for me to handle a variety of things. It sort of keeps me up with the times. The more I carry in my yard the more I have to carry in my head—and a man's brain needs exercise as well as his biceps, or it'll get soft. A wheat farm may make money, but it isn't near as interesting to live in as a garden. I guess it is a good thing for a man to have not only as many points of contact with his customers as possible, but as many points of contact as possible with the world outside.

"That is what I would have said to that fellow if I had thought of it at the time."

What is said to be the largest individual exhibit of building materials in the Northwest is that conducted by Raymond C. Grant on the third floor of the Power Block Annex in Helena, Mont. Mr. Grant is exclusive representative for a long list of manufacturers of all sorts of building materials and at the same time is a specialist in store fronts, representing, as he does, the "Brasco" system and the "Hester" all-metal construction. One of the post cards which he is sending out shows the brick, tile, marble, brass and metal store front display in the exhibition room of Mr. Grant.

IMPRESSIONS OF A BUILDING AGE TRAVELER

SOME LITTLE LESSONS GATHERED FROM RECENT VISITS WITH ENTERPRISING EASTERN DEALERS

IN a conversation with J. Frederick Martin, secretary of the Pennsylvania Lumbermen's Association, recently he suggested that I stop off at Lancaster, Pa., some time and run out to New Holland to see Paul Musselman, of Musselman Bros. Upon alighting at the Lancaster station a few days later I recalled my only previous visit to that city, which was the occasion of my being stuck $500 on a horse deal. This thought made me rather gloomy for a moment, but Mr. Martin's assurances of the pleasure to be gotten from a visit with Paul Musselman caused me to rush into the Brunswick hotel, where I adorned myself with a clean collar and a smile and asked the clerk how far it was out to New Holland. The clerk looked wise, as is the habit of hotel clerks, consulted the telephone girl, and informed me it was sixty minutes by trolley, or $5 by automobile. Without waiting to be told whose auto, I took the trolley, which cost me twenty-five cents each way, and learned afterwards that it was just eight miles and that I might have saved 10 cents by purchasing a round trip ticket.

A PEACEFUL HAMLET

After riding just fifty-eight minutes through the "richest agricultural county in the state," I learned from a sign-board at the roadside that we were entering the borough of New Holland. New Holland impressed me as being just like other peaceful and beautiful Pennsylvania villages, except that, if anything, it was a little more peaceful and beautiful than many others. Upon inquiring for Musselman Bros. I was directed down a side street, of which there are several, New Holland boasting a population of 1000, only 500 of whom live on the main thoroughfare. At the railroad crossing I saw the sign "Musselman Bros., Lumber, Coal, Feed and Grain."

The office was the usual small frame building of one room, with a railing to keep visitors from too intimate contact with the cash drawer, etc. The cash drawer in this particular instance proved to be a somewhat important factor, as Mr. Musselman informed me later that they did a strictly cash business. But even so, after waiting until an insurance agent had failed to sell Paul a policy covering all manner of things that might happen to his new auto, I was invited back of the railing and soon realized why Mr. Martin had suggested my going to New Holland.

Paul Musselman entered this business six years ago, a young man with a knowledge of modern office systems and accounting, advertising and sales methods, but without experience in the retail business. He was ambitious and believed modern business methods could be applied with profit to the conduct of a business of this character in a small town. A clear thinking, analytical mind, capable of checking results from every standpoint proved a safeguard against evil results for which youthful ambition and lack of experience might otherwise have been responsible.

ADVERTISING PAYS

He tried various methods of advertising and checked results in such manner as to know returns from every dollar spent. He changed his ads frequently to ascertain what kind of copy made the most effective appeal with the people of that particular community. He used personal letters with circulars and follow-up letters, as well as space in the local paper, keeping a careful record of expense and results until he knew without guessing at it how much and in what manner money could profitably be spent in advertising.

Mr. Musselman is still an enthusiastic believer in advertising, but has learned with regard to the farmer trade, in his section particularly, that no matter how well the advertising may be done a personal canvass is necessary to support it and land the business. He accounts for this by saying that "lots of Lancaster County farmers don't read anything but the Bible," a condition which would hardly apply throughout the country generally. Some of the advertising which failed for him has proved successful elsewhere, and vice versa, which emphasizes the importance of every dealer studying conditions in his particular territory and finding out just what method of publicity he can use with greatest profit.

A SYSTEM OF KEEPING RECORDS

His system of keeping records was particularly interesting. The business is divided for this purpose into four departments, coal, lumber, feed and grain and specialties. Paul knows just what percentage of the total business results from sales in each department, what percentage of the overhead is consumed in handling each line, what the turnover is with each line, and what percentage each contributes to the total profit. You may say this is too complicated and involves too much work and detail. Well, it isn't complicated, and Paul partly promised he would explain this method in the columns of BUILDING AGE in the near future.

He didn't tell me, nor did I ask, how much business he did, or how much money he made or lost. But of one thing I am sure, if he isn't making a fair profit he knows why, and will find the remedy. If all dealers would systematically gather the information which Paul Musselman has compiled for Musselman Bros. and then act upon it, the whole in-

dustry would be more profitable and everybody would be happier. I enjoyed my visit with Paul Musselman, and thank Mr. Martin for the suggestion.

GETTING AT THE COST OF DOING BUSINESS

When I got back to Lancaster that same evening I called up Mr. Pyfer of B. B. Martin & Co., and asked him to come over to the Brunswick and have dinner with me. I had reference to the evening meal which they call dinner at the Brunswick, but Mr. Pyfer said he had his dinner at noon and never ate anything in the evening, but that he would be at his office until late and invited me to come out there. I went out about 7 o'clock, and found him still dictating replies to the day's mail. He explained that the yard foreman and head bookkeeper were both sick and he was holding down these jobs in addition to his own. During the twenty-eight years he has spent in the retail lumber business in Lancaster he has acquired a knowledge of detail which qualifies him to take anybody's place.

There are fifty retail lumber dealers in Lancaster County, and Mr. Pyfer knows every one of them. Without a formal organization, but largely through the efforts of the Martin company and Mr. Pyfer particularly, these dealers meet three or four times a year to discuss local conditions and trade practices. This is producing a better understanding and more friendly relations. The discussions are confined to practical questions, such as overhead, turnover, expense of handling and delivering, etc., not only in a general way but as applied to specific items. Other dealers in the county upon whom I called referred to these meetings, and said they had learned through these discussions that some items on which they supposed they were making money were actually being handled at a loss, while others could be priced at a lower margin and still yield a fair net profit return. This is gradually leading to a uniform method of figuring expense, and the establishing of retail prices on the basis of an intelligent distribution of overhead.

A DEALER'S VIEWS

As Mr. Pyfer expresses it, "None of us want to do business at a loss, neither do we want an excessive profit, but unless we know the cost of handling each item, the proportion of overhead it should carry, and fix the retail price accordingly, we are doing an injustice both to ourselves and our customers. Why ask the man who buys a thousand feet of boards to pay the same gross margin over cost that is paid by the man who buys lath, when it costs twice as much to handle the lath as it does to handle the boards; that is, twice as much to handle a hundred dollars' worth of lath as to handle a hundred dollars' worth of boards? It isn't fair to the dealer or to the customer. The trouble is, so many yardmen never figure these things out; they think it's too much trouble. Well, it isn't much trouble if you go at it right, and it means the difference in many instances between profit and loss. Yes, between ultimate success and failure. We don't need any association to fix prices. What we need is to have dealers know how to figure expense and the law of self-preservation, and individual justice will take care of prices.

"It isn't a matter of the application of the Golden Rule even, it is only good common sense. And like most of the disagreeable and unprofitable situations we meet as we go through life, it is the result of ignorance. If you fellows can do anything to waken up the dealers in building supplies, and cause them to think and apply good common sense to the conduct of their business, you will be doing a big thing not only for the dealer, but the manufacturer and consumer as well. Go to it; I'm with you in every way."

This conversation was so interesting that it was 11 o'clock before I knew it. But I found out why Mr. Pyfer doesn't need an evening meal. He eats work and thrives on it.

Holley, N. Y., is a town of about two thousand population in the extreme eastern part of Orleans County. It is on a branch of the New York Central railroad and surrounded by a rich agricultural region. The auto tourist in passing through would think of it as a typical small town of northern New York, impressive only in that it is big enough to have a police officer stationed in the Square to enforce the speed laws.

AN ENTERPRISING DEALER

The nearest large city is Rochester, about twenty-five miles east. Albion, the county seat of Orleans, but a town about the same size as Holley, is five miles west, with Medina, boasting a population of six thousand, twelve miles to the west of Albion. Holley has no particular advantages as a business center, therefore, but as the auto tourist surmises is a typical small town with the usual number of stores, moving picture houses, ice cream parlors, etc.

About forty years ago a man named Cole started a lumber yard in Holley. His son, N. L. Cole, worked for him, and in 1884 succeeded to the business. This circumstance doesn't make Holley any different from hundreds of other towns. In fact, it is not any different, and the purpose of this preamble is to develop that fact. N. L. Cole has practically the same problems to meet in serving the people of Holley and vicinity that all other small-town dealers have. The Cole lumber yard looks just about the same as lumber yards generally look, along the railroad tracks, of course, with the usual small frame building for an office. Mr. Cole was not in the office when I inquired for him, but one of the drivers who happened to be out front told me he was down in the yard, and that word had been sent to him that someone wanted to see him. This impressed me as an act of courtesy not actually required, nor always received from the men working around lumber yards; but I found later that if not required, it was at least expected by "the boss" that every man around this particular yard would do everything he could to accommodate customer or visitor.

When Mr. Cole came in I told him I was gathering some information relative to dealer practices in connection with the retailing of building supplies,

particularly in the smaller towns, and that Secretary Collier of the Retail Lumber Dealers' Association of New York has suggested that I call upon him. "Well," said he, "I don't know what I could tell you that you don't likely know already. You see, I learned my trade as a carpenter, then started as a builder. Contract building is still a big part of my business, but my father had this lumber yard started here, and I took it over in 1884, and have been doing the best I can with it since then."

In a community like this, I suggested, the builder likely has a lot of problems in connection with designing and construction that the architect and building engineer solve for the contractor in larger places.

"Yes," said Mr. Cole, "and I always try to do the best I can for the man I'm working for. I read everything I can get hold of, and have books of plans, etc., but most of the stuff printed has too much detail for me to use it. It's too hard to dig out the simple and important things I want to know."

"But," I asked, "can't you get this information from the papers which are printed to help the contractor and builder?"

WHAT A DEALER THINKS OF BUILDING AGE

"Some of them are pretty good," he replied. "I guess I've tried about all there are printed. The only one I take now is BUILDING AGE, and it is the best of the lot. I get a good bit of help from that paper," as he took a copy of BUILDING AGE from the drawer of his desk.

Up to this time I had not informed Mr. Cole for whom I was gathering this information, or the purpose for which it was intended. When I told him that the object of my calling upon him and others was to find out how BUILDING AGE might be made more useful, he had some interesting things to say.

"It's pretty good as it is, but we have so many different kinds of buildings to figure on that it would help to have simple plans for schools, moving picture houses, small factories, store buildings and all kinds of farm buildings. Not only the plans, but information about the best kind of materials to use. We try to keep up to date on these things, and reliable information about different materials and where they can be used to advantage is a big help sometimes. One of the hardest problems I get up against is in repair work. Remodeling and changing over residences particularly. If there was some way to give us ideas on that kind of work it would help."

All this was very interesting, but the principal object of my call was to learn about the dealer situation. In reply to my inquiry about the different kinds of materials handled, I learned that Mr. Cole carried not only lumber, but a full line of building supplies, including mason materials, hardware, paint, etc. He said in this connection:

"I try to keep a full line of everything the people in this community need for building, and try to keep posted on the best materials to use. I do some advertising in the local papers and conduct the business the best I know how. Of course, we can't have everything just like they do in the bigger places and cities, but we try to keep up to the times."

THE RETAILER'S SECTION

I then explained how it was proposed to add a section for the retailer in BUILDING AGE and the dealer helps it would include. "Will this help you?" I asked.

"It certainly will, and I wish I had had such a paper to study when I started in this business. Many times during the thirty-three years that I have been in this business it would have helped me to have such a paper. It is just the things you intend to write about that have caused me trouble, and if I had had the experience and advice of others to study in this way I could have avoided lots of mistakes and made more money. I'm glad you're going to make that kind of a paper out of BUILDING AGE. It will help more than ever. When did you say the first number would come out? I'll be looking for it."

And so I said good-bye to Mr. Cole and drove out of Holley. But this talk with him will always make Holley seem a little different to me than the hundreds of other small towns "just like it." Different, because it was in Holley that I became impressed through the retrospection of an honest, earnest man, who has spent the best years of his life trying to serve the people of this community—that BUILDING AGE has before it a greater field for usefulness and service.

BARGAIN POSTAGE ON MAIL-ORDER CATALOGS

In connection with the attention given by the House of Representatives to the proposed increases in second-class mail rates, Congressman Halvor Steenerson of Minnesota brought out some particularly interesting facts, demonstrating that the Government has been transporting mail-order catalogs at rates which have not afforded a large margin of profit, and have facilitated the distribution of the catalogs to an extent that undoubtedly has materially increased certain mail-order dividends.

Mr. Steenerson may well be allowed to tell his story in his own interesting way. He said:

The gentleman from Illinois [Mr. Rainey] spoke about the Bible being shipped as books and that it cost 8 cents a pound to ship it to California. Do you know that up to the present administration catalog houses shipped their catalogs as books? They shipped them as books and paid a flat rate of 8 cents a pound. The Sears-Roebuck catalog and many others weigh 5 pounds apiece. Therefore, they paid 40 cents.

Mr. JOHNSON of Washington. How do they get that rate?

Mr. STEENERSON. They shipped them as books formerly. Wait a minute now. They used to pay 40 cents for each catalog to get it to the farmer's house. On Dec. 6, 1914, Mr. Burleson issued an order, which I will print in the *Record*, taking effect March 16, 1914, taking books out of the third-class rate under the general authority there is in the

parcel-post law and placing them as parcel post. Now, what difference does that make? Talk about graft! The gentleman from Illinois [Mr. Rainey] said there was not any except in the publishing business mostly over in Maine.

ORDER OF THE POSTMASTER GENERAL

OFFICE OF THE POSTMASTER GENERAL,
Washington, December 6, 1913.

(Order No. 7705)

On and after March 16, 1914, the classification of articles mailable under section 8 of the act of August 24, 1912, authorizing the establishment of the Parcel Post Service, shall be extended so as to include books. The rate of postage on books weighing 8 ounces or less shall be 1 cent for each 2 ounces or fraction thereof, and on those weighing in excess of 8 ounces the regular zone rate shall apply.

All regulations or parts of regulations in conflict therewith are hereby rescinded.

A. S. BURLESON,
Postmaster General.

Sears, Roebuck & Co., according to the Post-Office Department's information, given to me, sent out from 5,000,000 to 6,000,000 catalogues, on which they paid 40 cents apiece, or $2,400,000 a year. That was only one concern. The postage on catalogs, big and little, that were shipped as third-class matter, amounted to $10,000,000 at least. What was the result of the order that Mr. Burleson gave? Sears-Roebuck took the catalogs out of the mail and shipped them by freight to the principal cities. Baltimore gets them here in this zone, and they ship them 150 miles, 5 cents for the first pound and 1 cent for the next. We ship freight from Minneapolis to New York at 25 cents a hundred, a quarter of a cent a pound. They ship these catalogs for less than a cent a pound. Therefore, upon every catalog that Sears-Roebuck and these other big mail-order houses ship, they save 25 cents. There is a pretty good graft. Why do they not do that with the Bible, which the gentleman from Illinois [Mr. Rainey] mentioned? Because the demand for Bibles on the Pacific Coast does not justify them shipping in carload lots. [Laughter.] If they should ship them in carload lots, they could easily ship for about 1 or 2 cents a pound to the Pacific Coast, and then you could distribute them by parcel post at this low rate. The demand for Bibles over there is not great enough, however.

Mr. JOHNSON of Washington. How does the gentleman know we do not receive them by freight?

Mr. STEENERSON. Well, I do not think you do. I am speaking practically. This is no joke. The fact is that the order issued by the department admitting catalogs, which are books, into the parcel-post rates has deprived the Government of millions of dollars. Now, the principal man in Sears, Roebuck & Co. lives in Chicago. His name is Julius Rosenwald, and I did not know what he would do when I said two years ago, in discussing the catalog business, that if he did not pay a big sum to the Democratic campaign fund he was an ingrate. [Laughter.] He does not appear as a contributor, but he has served on one of the finance committees of the Democratic campaign, and he is a member of the National Defense League, or whatever it is. A gentleman who sat at a banquet table with him recently told me that he was so patriotic that in order to set a good example for the liberty loan Mr. Rosenwald said he was willing to take $1,000,000 of this liberty loan without interest for a year. [Laughter.] I should think he would after he has made over $1,500,000 a year for the last three years out of the Postal Service. Would not you? Would not you be patriotic, too? [Laughter.]

ECONOMIZING IN FREIGHT CAR SPACE

After a very thorough investigation of the subject, the Pennsylvania Railroad System has come to the conclusion that if the wasted space in freight cars on its lines were utilized, the result would be equivalent to placing more than 120,000 additional cars in service.

In an endeavor to bring about the more complete utilization of car space, the Pennsylvania System has issued a series of car utility bulletins, the purpose of which is to induce shippers to load cars to their full capacity and to induce buyers of all kinds of commodities to insist upon full carload shipments.

Diagrams have been prepared, showing the actual dimensions of commercially accepted carloads of various commodities and the maximum carloads which might be shipped if manufacturers, jobbers and buyers would agree on larger commercial selling units.

As an illustration, the Pennsylvania's investigation has shown that in the sugar industry a carload commonly consists of 400 bags of sugar weighing 40,800 lbs. In one of the recent bulletins a diagram is presented, showing how to load 1000 bags of sugar into a car which normally would carry 400 bags, the weight of the full carload being 102,000 lb.

The Pennsylvania is calling the attention of all of the principal industries to the possibility of increasing average car loading and thereby decreasing very materially their car requirements.

While building materials, on account of their bulk, do not always afford opportunities for proportionate saving by the utilization of wasted car space, it has been found that very material economies could be effected if dealers and other buyers of lumber, cement and other bulk commodities used in building would insist upon maximum carloads.

There seems to be a strong conviction among builders in many sections that while there may be no recession in present prices of materials entering into construction work, the upward movement has about reached its limits. As a consequence a number of prospective builders have come back into the market within the past few weeks, and are laying in supplies to meet their requirements for the immediate future.

"Whom do you think the world owes the most to —Columbus or Shakespeare?"

"Well, I don't know; I guess it owes the dealer about as much as anybody."

AS SEEN BY THE MAN ON THE ROOF

ITEMS OF SERIOUS IMPORT THE DEALER IN BUILDING MATERIALS IS LIKELY TO APPRECIATE

ANOTHER RESTLESS NIGHT

The young bookkeeper at the contractor's office looked haggard as he climbed up to his desk this morning and opened his ledger.

"Whatsa matter withya?" asked the stenog.

"Lightning struck our flat building last night, that's all."

"Did it do any damage?"

"I should say it did. It woke the baby."

PETER STUNG AGAIN

"What kind of a fellow is Touchem financially?"

"Well, Touchem is one of those guys who comes around and borrows ten dollars from you to pay some other fellow he owes five."

WHATDYEMEAN HEROIC?

THE MISSUS.—In wartime, instead of getting married, don't you think a man ought to do something heroic?

THE OTHER HALF OF THE MATRIMONIAL SKETCH.—Well, what do you call that?

VERY OFTEN

Art is languishing in this country: A chauffeur often knocks down more than an artist draws.

A BETTER SYSTEM

"When you are a little doubtful about a man do you make him pay the whole bill in advance?"

"Oh, no. He would think I was mean if I did that. So I just double the price and make him pay half."

IT NEVER DOES

BROWNE.—I see that a spy in England has been sentenced to be shot at sunrise.

GREENE.—Well, if they don't do it until then, he will live to a ripe old age.

ONE WAY WE HADN'T THOUGHT OF

NEIGHBOR.—Why did Smith, the contractor, decide to have an operation for appendicitis?

GROCER GREEN.—That was the only way he could collect what the doctor owed him.

A BUM ATLAS

BOOKKEEP.—Why is the boss cussing the new atlas, do you suppose?

STENOG.—He read that an American ship was torpedoed in ballast, and he can't find it on the map.

England right now is like an upper berth: It isn't so bad after you once get there.

GUARDING THE GIRDERS

THE SWEET YOUNG THING.—They say that guard duty is so hard, but Harold must be having just a lovely time.

THE PLAIN GINK.—What makes you think so?

THE S. Y. T.—He wrote me that for three weeks now he had been assigned to a bridge party.

MASONWORK AT THE DAM

"I see that the engineer at the dam has joined the Masons."

"Yes. Now they call him an hydraulic R. A. M."

The only way a swimmer keeps afloat is by steadily pedalling; and it's about the same way with a salesman.

CUTTING THINGS DOWN

"Isn't that awful?" exclaimed the dealer's wife as Mrs. Banker, in an evening gown, swept by them into a box at the theater.

"That is just this war economy, my dear," replied Dealer. "She is trying to dress with as little waist as possible."

SELECTIVE CONSCRIPTION

"I see that Boozer has enlisted in the army."

"That so? As a soldier or a tank?"

He is an unlucky man whose income doubles, because that means that now he will spend three times as much.

APPARENTLY THIS ONE DID

HIM.—Did you ever know a woman to take a joke?

HER.—Yes, and then wish that she had stayed single.

UNANIMOUS

"Don't you think it is a fine idea to enthuse your employees by encouraging them to make suggestions?" asked the Man Across.

"Yes," replied the Fellow in the End Seat, but a little dubiously. "However, sometimes it doesn't work out just the way you expect."

"For instance?"

"Well, when all this talk about beating our Fords into ploughshares and planting the golf links started, we invited all the country club employees to send in written suggestions as to what would be the best thing to raise in order to combat the high cost of living."

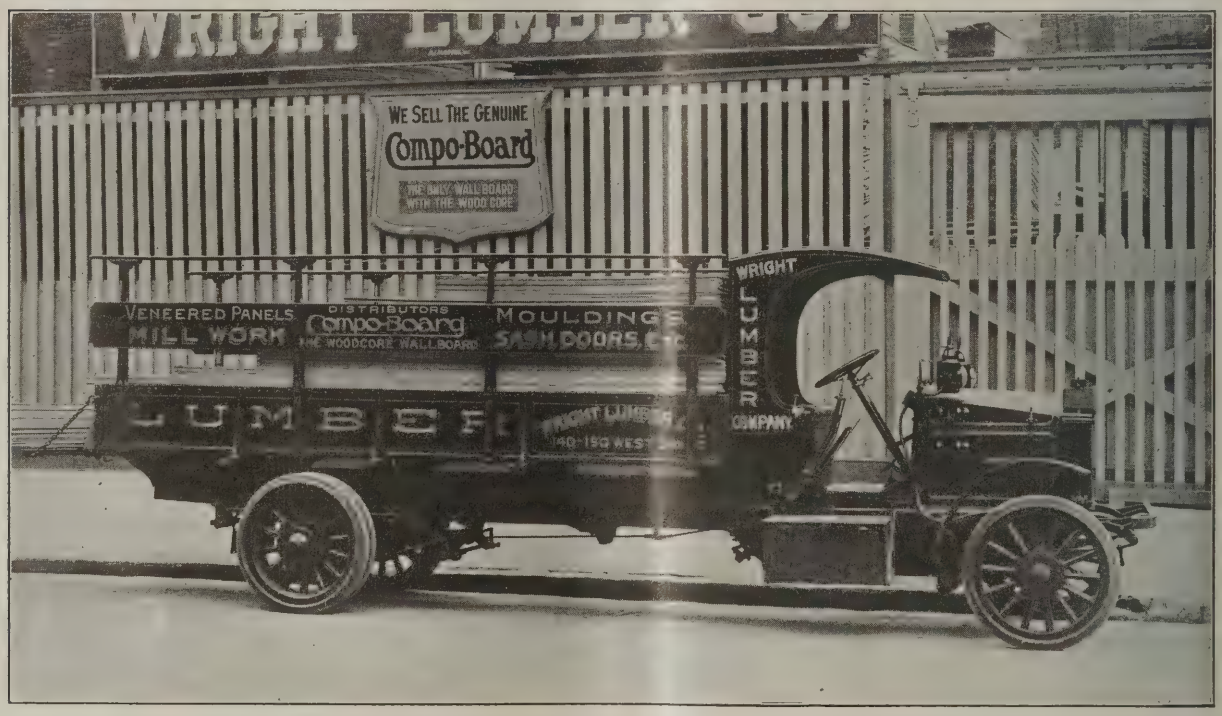
"And you didn't get any replies?"

"Yes, we got twenty-seven, all the same: 'Wages'."

UP-TO-DATE MOTOR TRUCK EQUIPMENTS

TWO STYLES OF TRUCKS USED BY LUMBER DEALERS—WORK ACCOMPLISHED BY TRUCK VERSUS HORSE

THE motor truck as an adjunct of the equipment of the lumber dealer has met with the unqualified approval of up-to-date men whose business requires high efficiency. Its superiority over the horse is undoubted, for it retains its efficiency in the face of climatic conditions which ordinarily disrupt horse service. In addition to dependability, the motor truck can take more and longer runs in a day than is possible for the horse. In this connection we present an illustration of a style of Pierce-Arrow truck which the Wright Lumber Company, 140-150 West 38th Street, New York City, has found eminently satisfactory. This company handles various kinds of trim, millwork, sash, doors, moldings, Compo Board, etc., and, in view of the unfavorable traffic conditions often prevailing in a large city like New York, it has found that the dependability of the motor truck is essential to the welfare of its business.



A PIERCE-ARROW MOTOR TRUCK AS USED BY AN ENTERPRISING LUMBER CONCERN IN NEW YORK CITY

Another style of Pierce-Arrow Motor Truck is being used by the Capitol City Lumber Company of Hartford, Conn., which has kept an accurate record of the truck in comparison with its horse teams. The computation in both cases is based on the total investment, insurance, interest, up-keeps, repairs, etc., the entire comparison being made as fairly as possible. It was thoroughly demonstrated that the truck replaced five and one-half teams, and that the truck would deliver lumber at a cost of 36 cents per 1000 feet, while the team cost 75 cents per 1000 feet, or more than twice as much.

The truck used by this concern is equipped with a roller body and has, as an accessory, a small four-wheel loading wagon for gathering lumber about the yards and having the load ready for the truck. By actual timing it has been found that it takes three minutes to transfer the lumber on the truck and two minutes to unload, without damage of any kind to the lumber.

This kind of up-to-date service is undoubtedly of great benefit to the lumber dealer who is seeking efficient equipment, and whose business requires the elimination of the many annoyances arising from the use of horse and team for haulage and delivery purposes.

A reinforced concrete chimney 570 ft. high, and said to be the highest in the world, has recently been completed at Saganoseki, Japan. It was designed and erected by the Weber Chimney Co., Chicago, Ill.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

"Economy" Builders' Hoists

One of the latest additions to the extensive line of builders' hoists manufactured by the Northwestern Steel & Iron Works, Eau Claire, Wis., is the "Economy" No. 2, which is intended especially to meet the demand on the part of contracting builders for an inexpensive outfit. This outfit consists of complete hoist on a frame of 4 x 6 in. pine securely braced and bolted with sprocket wheel for counter shaft; 10 ft. of No. 88 chain and sprocket wheel for engine. The friction clutches are of the expanding internal ring type and consist of only three parts, the outside clutch case, the internal expanding ring and the dog or lever for the expanding ring. Two clutches are provided on the counter shaft, one case with a gear pinion driving the drum in one direction with large gear on the drum. The other clutch is cast with small sprocket wheel on the countershaft which drives the drum in the other direction by means of a sprocket chain around the sprocket on the drum. A single operating lever controls both clutches. The "Economy" hoists are equipped with powerful friction band brake of the automobile type and opened with hand or foot lever. The brake band is lined with asbestos friction brake lining. The cable sheave is keyed to the drum shaft around which the hoisting cable is wrapped for operating double platform elevators. The makers point out that a special ratchet brake can be furnished with this hoist for locking the drum to hold the load when operating a single platform elevator, derrick or hoisting with a single line. The hoist is furnished with or without engine, although a Northwestern 5-hp. engine of the horizontal hopper cooled type is usually desired, owing to the fact that the frame is designed especially for it. The claim is made that a 5-hp. Northwestern engine will lift 1500 lb. 100 ft. per minute. The hoist occupies floor space 8 ft. one way by 28 in. the other. The weight of the hoist without engine is 440 lb. and with the engine 1540 lb. A general view of the hoist is shown in Fig. 1. A four-page folder which the manufacturers have issued illustrates and describes other sizes and types of builders' hoists which have been recently placed upon the market.

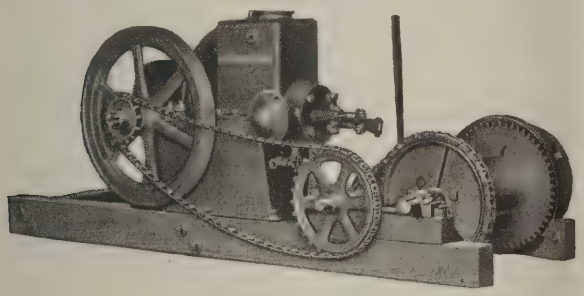


Fig. 1—The "Economy" Builders' Hoist

White's Jointer Shield

A device which in its present form represents the result of a great deal of investigation and repeated experiments together with tests of efficiency under all probable and possible conditions involving the safety of the operator and the adaptability of it to the general work of the jointer is the shield which we illustrate herewith and which is being made by J. J. White, 1480 Fifteenth Street, San Francisco, Cal. The device is made of wood to which is affixed a casting equipped with a socket. This socket is made to fit the upright pin of an automatic spring check, somewhat similar to an automatic door check, and is permanently attached to the main body of the jointer so that it can in no way interfere with or retard the general movements of the operator. The arrangement is such that the shield is said to never touch the moving table but rests on the upright pin and the back table. It is flat, fan-shaped and ⅜ in. thick, all as indicated in Fig. 2, while Fig. 3 shows its application on the machine. Its speed in readjusting itself is regulated by the spring in the check, which can be tightened or loosened at will. The shield with the spring, light or stiff, serves as a pressure bar to hold the board in place and thus facilitates the work of the operator. The claim is made that with the guard in position the operator can easily accomplish very much more work than he can with it off. Under ordinary usage the shield glides back to the fence without noise and with a slow and even move-



Fig. 2—General Appearance of the Jointer Shield

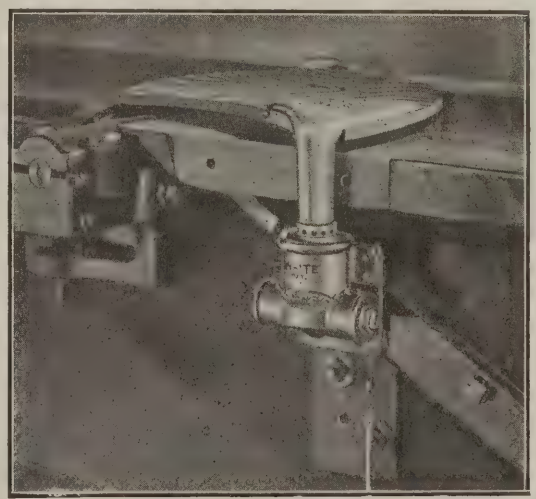


Fig. 3—Showing Application of the Jointer Shield

ment, but by the insertion of a pin in the check the shield is given a fixed position. The claim is made that in operation the board automatically adjusts the shield to its width as it passes through the jointer, the shield and the board thus covering the knives at all points. The shield swings back toward the operator following the arc of a circle, yet can never get in his way. When the board has passed over the knives the shield automatically glides back to the fence of the table. This jointer shield is of such a nature that there is practically no time lost in removing and replacing it as a safety guard when the operator desires to rabbet a board. He simply lifts the shield off the check and the table is clear. It is done almost, if not quite, as easily and quickly as lifting an ordinary tool and putting it aside. The maker claims that by means of this jointer shield it is absolutely impossible for the worker to receive an injury to his hands.

Cornell Wood Board Used at National Music Show

In the construction of the booths and the decorative effects at the Coliseum, Chicago, Ill., for the National Music Show over 150,000 sq. ft. of Cornell wood board was used. The committee in charge of the construction of the booths decided upon Cornell wood board after looking over various materials that could be used in this work. They decided upon this material because of its strength, and at the same time the ease with which it could be handled and decorated. As the entire construction work of this exhibition is made up of Cornell wood board and plate glass the finished appearance of the huge arena was that of a permanently built series of rooms, rather than the usual fragile appearance that labels exhibitions of this nature. A view looking down the aisle toward the end of the Coliseum is given in Fig. 4. In the home it makes a permanent and durable wall finish, and contractors and builders who use Cornell wood board in finishing homes usually obtain very satisfactory results.



Fig. 4—View Down Aisle Toward End of Coliseum at National Music Show with Booths Constructed of Cornell Wall Board

Goodell-Pratt Co. Enlarges Its Plant

In order to meet the growing demands of its business, an addition to the machine shop of the Goodell-Pratt Company, Greenfield, Mass., is being completed by the Aberthaw Construction Co., Boston. The new building is four stories in height, and of reinforced concrete construction throughout. It is 58 x 260 ft., with a four-story ell 58 x 110 ft. This will increase the floor area of the concern by about 86,072 sq. ft. The columns are of the mushroom type, those used in the basement being of 24 in. diameter, those for the first and second floors being of 22 in. diameter and those for the third and top floors being of 16 in. diameter. It is estimated by the architects, J. R. Worcester & Co., Boston and Waltham, Mass., that the total cost of the building will approximate $135,000.

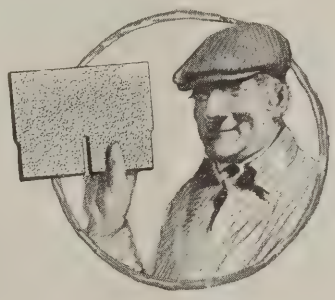
Consumers' Booklet of Berger's Expanded Metal Lath

Appreciating the fact that the average building owner is not fully educated up to the merits of metal lath, the Berger Manufacturing Company, Canton, Ohio, has just issued an interesting booklet which explains in a non-technical manner the importance of building for safety and permanency. The booklet emphasizes the advantages to the home owner in having expanded metal lath used in his building and it then points out the chief advantages of the lath which include among others the following: It reinforces the plaster over the entire surface, preventing cracking or falling; it does not absorb moisture, hence cannot swell, warp or stain the plaster; it is fire-resisting, thus greatly adding to the protection of a building; is sanitary and decoration can be applied immediately after the plaster is dry. The claim is made also that vermin cannot make holes through the walls and that maintenance costs are reduced to a minimum. Additional interest and value is given the booklet by means of several pages devoted to the proper decoration of rooms, harmony of colors and easy methods of figuring the amount of wall paper required for

(*Continued on page 22 of the Advertising Section*)



A Roofing Job That Lasts



A roof of Neponset Twin Shingles gives an old house a new lease on beauty and usefulness. But Neponset Twin Shingles have more than outward beauty to recommend them.

These famous shingles are made of such wear-resisting materials—tough, fibrous felt; layer upon layer of everlasting asphalt; crushed stone and slate that permanence is of greater importance.

A roof of Neponset red or green shingles on any house, old or new, is a "drawing card" for any contractor, carpenter or builder. It is a demonstration of his good judgment as regards beauty and durability.

NEPONSET
TWIN
SHINGLES

(Patent applied for)

BIRD NEPONSET PRODUCTS

Neponset Twins are self-spacing. Their twin shape halves the cost of laying and requires 25% fewer nails. They cannot warp, dry out, rot, pull off, curl or blow away. And they are approved by the National Board of Fire Underwriters.

You can get your share of the roofing contracts in your section by mentioning Neponset Twin Shingles. Millions of people already know about "this roofing development of the twentieth century" by reading our advertisements in the national magazines.

Let us submit some interesting facts and figures about Neponset Twin Shingles. We'll send them merely for the asking, and without any obligation.

Look for this trademark on all Shingles, Roll Roofings, Wall Boards and Building Papers. There is one meeting every requirement and purse—all guaranteed by us.

BIRD & SON (Established 1795) Dept. B East Walpole, Mass.

NEW YORK CHICAGO WASHINGTON Canadian Office and Plant, HAMILTON, ONTARIO



The new Murphy Can

For your own house

You wouldn't think of using anything but the best of varnish for your own house. You know that only the best is worth the cost of putting on. Don't you think your customers would also appreciate the best varnish?

Murphy Varnish

"the varnish that lasts longest"

produces a finish that brings out every good point of the wood and keeps your work looking well for years. It is exceptionally durable.

This extra durability, this extra value you give your trade, costs nothing, because Murphy Varnish flows more easily, covers more surface—and therefore costs no more—than varnish which doesn't last. And our advertising in the magazines is teaching your customers to appreciate this extra value and to look for it.

May we send you further information about our house-finishing products?

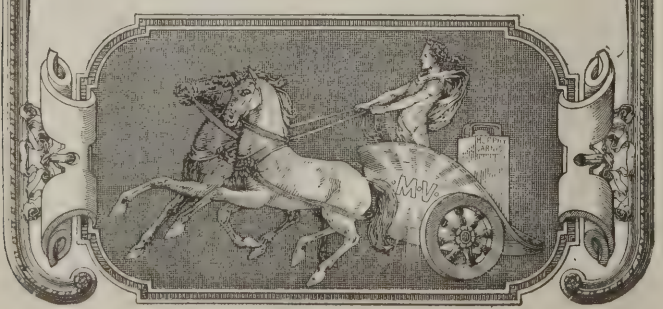
Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A



(*Continued from page 408 of the Editorial Section*)

various size rooms. Any reader of THE BUILDING AGE who is interested in this booklet can easily secure a copy by applying to the company at the address given above.

Larger Pittsburgh Quarters for Johns-Manville Company

Owing to the rapidly increasing business and the requirements for more commodious quarters in the Pittsburgh district, the H. W. Johns-Manville Company on May 20 opened new show rooms and sales offices on the ground floor of the Westinghouse building at the corner of Ninth Street and Pennsylvania Avenue, Pittsburgh, Pa. These new quarters provide ample space for the growing needs of the company and are located in the heart of the business district of Pittsburgh, being within a few minutes' walk of the Union Station.

New Light Weight Concrete Mixer

Practically every building contractor in the country is called upon now and then to do small jobs in connection with which a light weight concrete mixer could be used to good advantage and profit, especially for such work as foundations, floors, cellars, sidewalks, etc. A contractor with limited means who has been doing work by hand or a large contractor who has numerous small jobs on which it would not pay to move a big mixer cannot fail to be interested in the small machine so

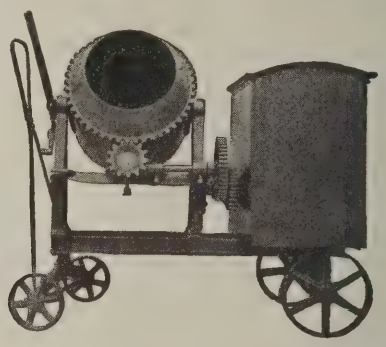


Fig. 5—New Light Weight Concrete Mixer

built as to meet the requirements of the case and at the same time prove a profitable investment. In order to meet the growing demand for a mixer of this nature, the Republic Iron Works, Tecumseh, Mich., has brought out a new model which is said to be so light that two men can move it around easily and is capable of turning out a good day's work, if necessary, handling up to 35 yd. of mixed material per day. A number of new principles are said to be involved in the construction of this mixer and for that reason it is likely to attract more than passing attention on the part of those contemplating a machine to operate on small jobs. The drum operates on ball bearings, making it very smooth and light running and requiring but little power. Reverse action is used for discharging which makes it much speedier and more effective in dry materials. For mixing batches for block and tile plants it is said to be especially well adapted and at the same time is suitable for handling anything from a very wet to a very dry mix, including brick mortar. A general view of the machine is presented in Fig. 5.

Paint Mixing Directions

Of more than ordinary interest to the members of the craft who are concerned with painting is a booklet entitled, "Mixing Directions for Combining 'Dutch Boy'

(*Continued on page 24*)

Get in Line for Permanent Roofs

By using nails that will last as long as the shingles you lay—*get*

Zinclad

SHINGLE NAILS

For every shingle roof. These nails will last a generation and are really the cheapest when measured by the years of service they give on the roof.

Zinclad Shingle Nails are sold by dealers in 32 states. If not sold in your city write us direct for samples and prices.

W. H. Maze Company

Peru, Illinois



For Every House in Town

there is a suitable KOHLER bath tub, lavatory and sink. You are sure to add to the attractiveness of the house or apartment you are building by selecting

KOHLER WARE

always of one quality—the highest

The beauty of the enamel, the hygienic designs and the excellence of construction are notable features of the plumbing ware produced by KOHLER OF KOHLER.

Be sure to investigate the merits of the "Viceroy," America's foremost built-in bath.

It is of genuine one-piece construction, easily installed and suitable in price for all classes of houses and apartments.

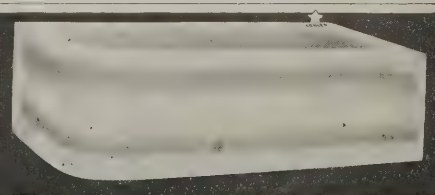
It is fully illustrated in our free book, "KOHLER OF KOHLER."

KOHLER CO. *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Pittsburgh Detroit
Indianapolis Chicago St. Paul St. Louis Houston
San Francisco Los Angeles Seattle London

★ *The star indicates the location of the KOHLER permanent trade-mark in faint blue.*

"Viceroy Bath"—Plate V-12
(Patent Applied For and Name Registered U. S. Patent Office)



White Lead with Pure Linseed Oil and Colors to Obtain Any Desired Shade Used in House Painting and Decorating," which is being distributed by the National Lead Company, New York City. The booklet contains panels for colors with twenty-one good combinations for exterior house painting and eighteen combinations for interiors, thus lending valuable aid in the combining of colors which are in ordinary use. Information concerning new and old outside work are also contained, together with color formulas which will enable the builder to readily reproduce any of the colors illustrated in this booklet. Of interest in estimating is the data given to aid in finding out how much paint will be required for various surfaces.

Care of Empty Cement Sacks

A carload of empty sacks is said to be worth more than a carload of cement, and it is certainly worth while for the builder to see that his empty sacks are returned to the manufacturer in good condition, as good and repairable cloth sacks are worth ten cents each, all other sacks being worthless. In returning empty sacks, railroad rules specify that bundles must be tied with three separate wires or with ropes not less than 3/16 in. in diameter. Linen tags should be used and freight prepaid to the destination. The Universal Portland Cement Company, 210 South La Salle Street, Chicago, Ill., is distributing information concerning the proper care of empty sacks in order to secure their return in good condition, and this will undoubtedly prove of benefit to both the builder and the manufacturer.

A New System of Hollow Concrete Wall Construction

A form of hollow concrete wall construction in which builders all over the country are likely to be interested is illustrated and described in a handsome catalog

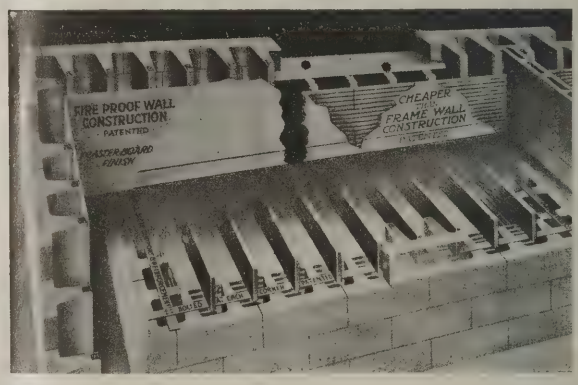


Fig. 6—A New System of Hollow Concrete Wall Construction

which has been issued by the Ferguson Synstone Company, 807 Seventeenth Street, Denver, Col. It is called the "Synstone System," and practically all of the various kinds of concrete walls that would be required are covered by the machine which this company has brought out. The shape of the blocks produced admits the use of a very wet mixture made of coarse aggregate in the proportion of 1:3:5 up to 1 in. screen. The block produced is said to show 3000 lb. per square inch crushing strength and able to withstand 1700 deg. of heat for one hour without injury. The single wall produced by the system in question is in effect a half wall, it being concrete on one side and lath and plaster forming the inner side. These single walls are made in units of 12 x 24 in. or less if desired. The capacity of the machine is said to be 100 sq. ft. per hour, using three men, common labor—two men at the machine and one mixing. As there is no inner bond to take care

(*Continued on page* 26)



FLEX-A-TILE Reversible Slab Laid in American Shingle Style

2 Styles In 1

Lay Either End to the Weather

GENUINE FLEX-A-TILE Asphalt Shingles in another, unique style—a slab of four FLEX-A-TILES in one made so that either end can be exposed, to suit the taste of the builder. Diamond style at one end and square American Shingle style at the other.

First decide on FLEX-A-TILE Asphalt Shingles for their permanent beauty, durability, ease-of-laying, and time, weather and fire resisting qualities. Then place your order for

FLEX-A-TILE

Reversible Slab Asphalt Shingles

immediately. There is no need to select the *style* of shingle until later; then, whichever style is chosen by the builder—diamond or square American shingle—you will be prepared with FLEX-A-TILE Reversible Slabs. Besides these two standard styles, many ornamental effects may be obtained by alternating the positions of the shingles.

This new slab style of FLEX-A-TILES *saves 50% in time and labor of laying; 35% in freight; and 38% in nails.* Comes in either rich red or deep green, fadeless, natural-stone surfacing. Can be used equally well on new work or over old shingles.

Write now for samples and prices.

THE HEPPES-NELSON ROOFING CO.

Factories: Minneapolis, Chicago and in New Jersey
Dept. B-1011 Kilbourne Avenue, Chicago

FLEX-A-TILE Slab Shingles No-Tar Asphalt Paint
Other Guaranteed Heppes-Nelson Products

DEALERS: A few territories are open for live dealers. Write us for proposition.



FLEX-A-TILE Reversible Slab Laid in American Diamond Style



Fiberlic

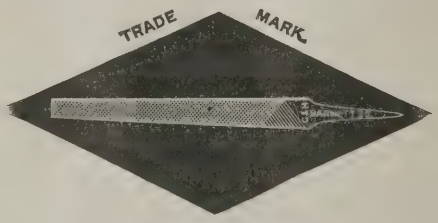
Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.
Owned and Operated by Nicholson File Company

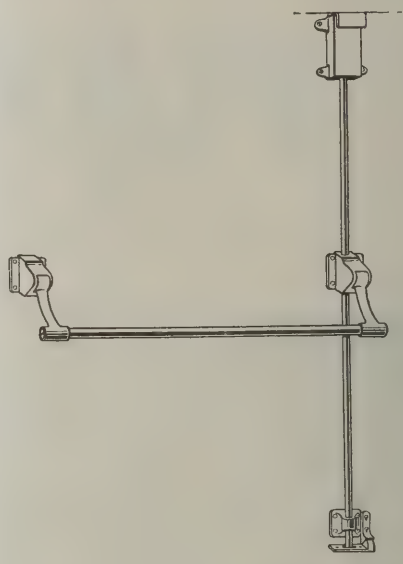
of, the walls are quickly laid, simply breaking joints. The illustration presented in Fig. 6 shows the method of building the inner wall. Where wood and plaster are used for the inner wall, this construction is said to cost no more in most places than frame. The catalog which the company has issued is of an exceedingly attractive nature and is illustrated with finely executed half-tones and line engravings showing not only the method of construction, but also numerous buildings which have been erected in accordance with the system.

New Roofing Slate Concern

The partnership heretofore existing between James O'Halloran and A. E. Jacobs was dissolved by mutual consent on April 3 of the current year. Mr. Jacobs issued under later date an announcement to the effect that he had organized and will have the active management of the Jacobs-Thompson Company which will conduct a general jobbing business in all kinds of roofing slate and roofers' supplies with principal offices at 1128 and 1129 Park Building, Pittsburgh, Pa.

A New Exit Bolt and Bar

A new line of anti-panic exit trim made of iron with bronze tubing covering the horizontal bar and which is light, quick acting, simple in design and easy



A New Exit Bolt and Bar—Fig. 7—The No. 3357½ Exit Bolt

to attach, has just been placed upon the market by P. & F. Corbin, New Britain, Conn. The bar, which is designated as No. 3357½ and shown in Fig. 7, can be used with any of the Corbin anti-panic locks and latches. The No. 3367 bolt shown in Fig. 8 is supplied regularly for doors 8 ft. 6 in. high by 3 ft. wide, while the bar shown in Fig. 7 is intended for doors 3 ft. wide.

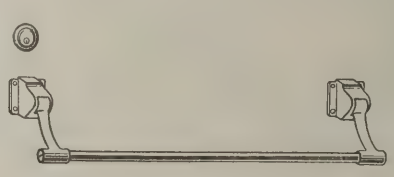


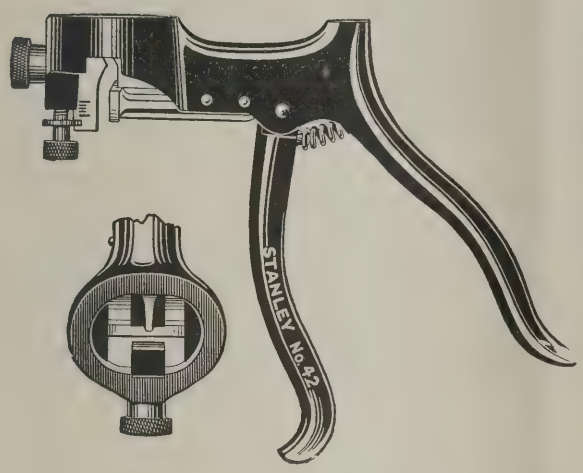
Fig. 8—The No. 3357 Exit Bar

In Fig. 9 is shown a section of the exit bolt No. 3357½ and clearly indicates the method of attaching the bolt head to the rod. In Fig. 10 is shown a section of exit bar No. 3357 and the threaded rod and tube. These latter cuts, taken in connection with Figs. 7 and 8, clearly indicate the construction of the bolt and bar and

(*Continued on page* 28)

Stanley Tools

Stanley "Pistol Grip" Adjustable Saw Set No. 42



This Saw Set embodies several unique and important features not heretofore seen in tools of this description.

The shape of the Body and Handle enables the user to operate the tool with great ease and with the least possible exertion, and the Saw is held firmly against the gauge while the tooth is being set.

It can be readily adjusted by means of the knurled thumb screw to give a greater or less set to the teeth of the saw, according as the saw is to be used for coarse or fine work. As the anvil or part against which the plunger works is graduated, the same adjustment can be easily obtained for duplicate work.

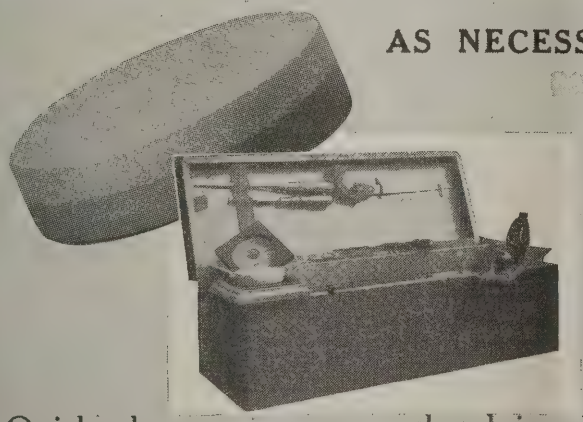
The tool is so designed that the saw teeth are in plain view which enables the user to quickly adjust the tool to the tooth to be set.

The plunger and anvil are made of tool steel—hardened and tempered. All parts are carefully machined and are interchangeable.

The tool is given a fine black finish.

Packed one in a box. For Sale by Hardware Dealers.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.



AS NECESSARY AS A SAW OR A HAMMER IN YOUR TOOL KIT

Carborundum Sharpening Stones

Quick, clean-cutting stones, that bring the edge to the tool with just a few strokes. **AND THEY CUT THE EDGE ON THE TOOL—THEY DON'T MERELY RUB IT ON** Every stone positively uniform in grit and hardness, holds its shape, shows long life. The round Carborundum Combination Bench Stones for general tool sharpening, the beveled edge slips for touching up gouges, carving bits, etc.—the extra hard, extra fine Carborundum stones for that finer edge for your finer tools.

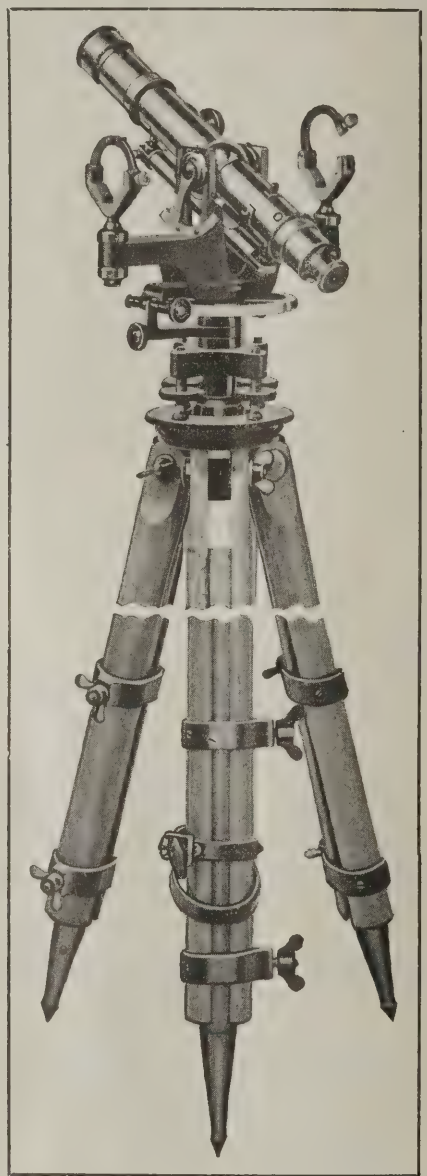
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NIAGARA FALLS, N. Y.

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FOR USE ON
CONSTRUCTION WORK



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DAVID WHITE CO. (Inc.)
421 E. WATER STREET
MILWAUKEE, WIS.

makes it possible for the man applying the devices to fix them to narrower or shorter doors simply by shortening the bolt rod or push car. When the bar of the No. 3367 bolt is depressed, thus withdrawing the bolt

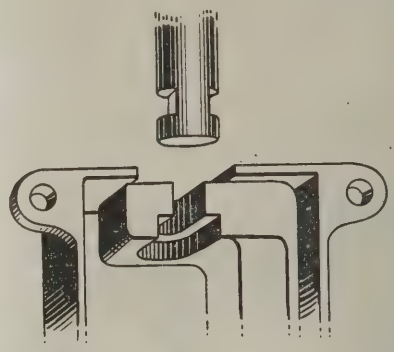


Fig. 9—Section of Exit Bolt No. 3357½, Showing Method of Attaching Bolt Head to Rod

head, they are held in a retracted position until the door is again closed, contact with the strike releasing the bolt and projecting them into the strikes. This provision, it is claimed, prevents the bolt from coming in contact with the floor or sill. The company anticipates that this line will find a ready demand for country schoolhouses and small auditoriums where the

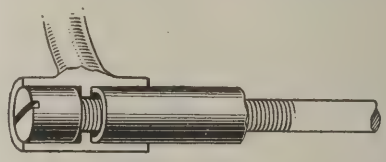


Fig. 10—Threaded Rod and Tube of Bar Shown in Fig. 8

law requires free exits and bronze metal fixtures would be too expensive. The small cost makes it possible to adapt these generally for places where panic is not possible, but where the locked-out function coupled with a ready exit is required, as for example in connection with doors to store rooms, laboratories, etc.

Early Stucco Houses

It is well known that in the quaint old Dutch homesteads in and around northern New Jersey, and those fine old mansions of Germantown and vicinity are to be found the chief examples of the use of stucco in Colonial times. Occasional old stucco houses are to be found in Virginia, New England and New Orleans, although in these sections of the country stucco was seldom used. A booklet entitled "Early Stucco Houses" and distributed by the Atlas Portland Cement Company, 30 Broad Street, New York City, gives some excellent photographic reproductions of many of these early stucco houses which were constructed in Colonial times. Many of the illustrations consist of window or door details which the old settlers found to be particularly effective in connection with stucco construction. The latter part of the booklet contains a section entitled "Modern Stucco Specifications," which is intended to furnish the architect and builder with a convenient guide for the preparation of stucco specifications. The matter is arranged in three separate columns covering the different types of construction, namely stucco on masonry walls, stucco on sheathed frame walls and stucco on skeleton frame walls. Materials and methods peculiar to one form of construction occur only in its particular column, requirements common to all forms being carried across all three columns. Variable parts are placed in italics. The specification is undoubtedly of decided value to the architect or builder who is in-

(*Continued on page* 30)

SARGENT

REG. U.S. PAT. OFF

Plane catalogue, with full description of these and other Sargent Planes, sent on request.



YOU'LL BE PROUD OF YOUR NEW AUTOMATIC

judging from the enthusiastic letters we have received from Proud Tool users. They all agree that their *Sargent Automatic-Set Bench Plane* is "The Best Plane Yet Out." Made in Six Sizes, the Superior Features to be appreciated by tool users are:

AUTOMATIC SET—The clamp, when replaced after removal, will always return to its original position until reset. This feature is a great time-saver. The clamp may be easily adjusted, by means of a regulating screw, close to the cutting edge when a fine cut is required, away from the cutting edge when a coarse cut is desired and may be set in as many intermediate positions as may be needed.

RIGIDITY—The Frog is very rigid and the Frog and Bed at the mouth are in alignment so that the cutter has an even bearing down to the bevel of the cutter. The Plane combines solidity, compactness and simplicity. The meeting surfaces of the Frog and Bed are all machined so that the fit is absolute.

EASE OF ADJUSTMENT—The lateral adjustment may be secured without removing the hand from the handle and the vertical adjustment, obtained through a direct acting thumb screw at the back of cutter, is positive and rapid.

SINGLE BIT—These Planes have a thin Cutter (No. 14 gauge), but the support for the Cutter is so solid below and the clamp so firm above, that there is no tendency to chatter, hence it is possible to use the thin Cutter and so get the slight advantage of the quicker grinding. The Cutter requires no cap as the clamp acts as a breaker for the chip.

PURPOSE—These Planes are intended for both heavy and very fine cuts. They are especially adapted for working against the grain on cross-grained hard wood where the absolute rigidity of the cutter avoids any tendency to chatter.

SARGENT & COMPANY, MANUFACTURERS

53 WATER STREET NEW HAVEN, CONN.



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Carload after Carload of Logs Required for DISSTON Hand Saw Handles

Most first grade mechanics are thoroughly familiar with Disston *Quality*, but probably very few realize the scale of production the popularity of Disston saws necessitates. This photograph affords some idea of it. The picture is of a *portion* of the Disston lumber yard and only *one* kind of wood, apple (several others also are used).

These cars are coming in almost constantly. The lumber is sawn into boards in our own sawmill and stacked to season for three years before using.

That's the kind of demand the Disston reputation for quality has developed.

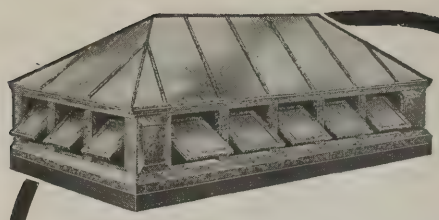
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HENRY DISSTON & SONS, INC.

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Are two things that every contractor and builder likes to guarantee his clients. And he can do this by specifying Willis Skylights and Ventilators. They are made of the very best sheet metal obtainable, combined with honest skilled workmanship.

You Will Recognize These As Valuable Features

The skylights have the greatest glass area—give perfect light. Any carpenter with a hammer and screwdriver can erect them. No putty nor solder required.

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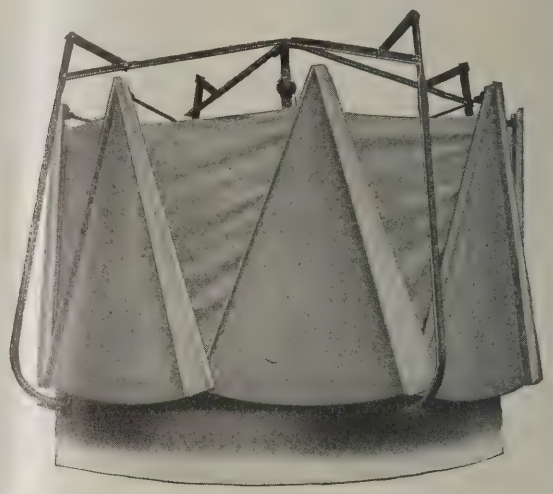


Patented Axis

terested in familiarizing himself with the latest and best practice in connection with stucco.

Buckeye Extension Silo Roof

A feature which builders are likely to find of interest in connection with silo construction is an extension silo roof made by the Thomas & Armstrong Company, London, Ohio, and which we illustrate in



Buckeye Extension Silo Roof—Fig. 11—The Roof Opened

Figs. 11 and 12. The roof is operated entirely from the ground by means of a rope running through a pulley at the top of the supports, and it can be opened as shown in Fig. 11, or closed as in Fig. 12, by a man or boy standing at the bottom of the silo. The point is made that its construction permits of the filling of the silo to a height ranging from 5 to 6 ft. above the staves, thus making ample allowance for shrinkage and avoiding the expense of a second filling. The roof is of such a nature that it can be installed on wood,

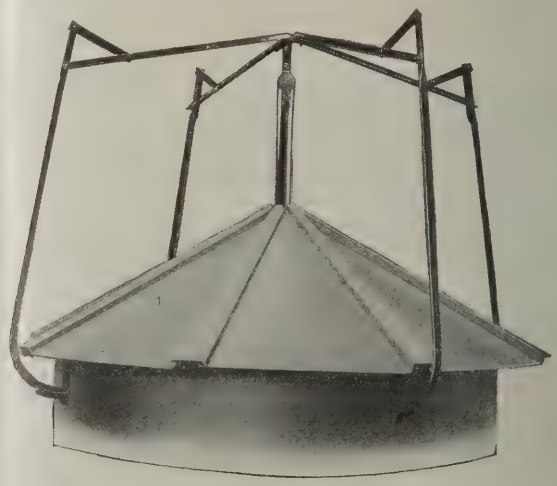


Fig. 12—The Silo Roof Closed

concrete, metal or tile silos, and is suspended on four wrought iron supports clearly shown in the illustrations, and which it is claimed offer practically no resistance to the wind. When open, as in Fig. 11, it forms an extension or continuation of the silo proper, and when closed, as in Fig. 12, the webs of canvas fold beneath the metal sections and are dry and unexposed. The Buckeye extension silo roof is made in sizes, with outside measurements ranging from 8 ft. in diameter up to 17 ft. in diameter.

(*Continued on page* 32)

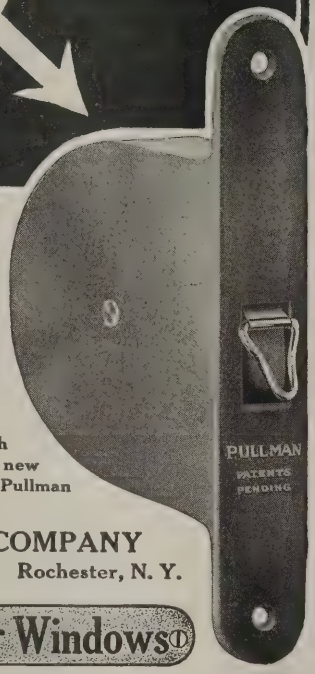
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PULLMAN Unit Sash Balances are made entirely of pressed steel. Are practically noiseless.

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Specified by hundreds of Architects. Approved by the Fire Underwriters Laboratories and may be used in fire proof buildings.

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"YANKEE"
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SAVES TIME AT EVERY TURN

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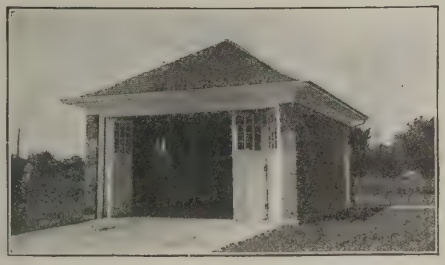
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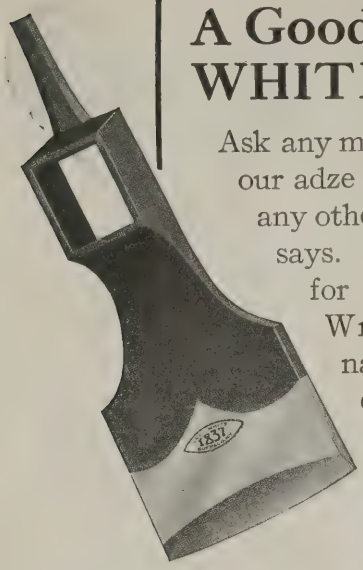
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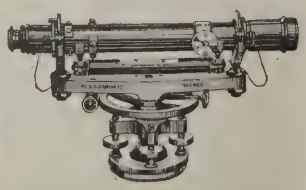
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The Finger-Cling Bond-Anchor for Brick Walls

Many of our readers will doubtless be interested in the device known under the above name and designed to serve the purpose of bonding brick walls to the joists and frame of a building. It is intended for use at every course, including the outside one, and it is so made as

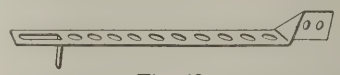


Fig. 13

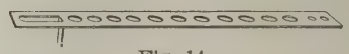


Fig. 14

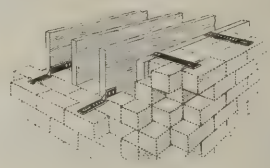


Fig. 15

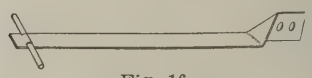


Fig. 16

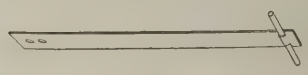


Fig. 17

The Finger-Cling Bond-Anchor for Brick Walls

to fit flat between the courses. The construction is such as to allow the mortar to harden in the loops, thus making the bond a part of the wall. The device is known as the finger-cling patent bond-anchor for brick walls, is light in weight, is easily handled, is made of steel and has great tensile strength. It is made flat and with right angle twist, so that it can be used on the top or sides of joists. It is designed to take the place of the old style pin anchors and has been placed on the market by the American 3-Way Prism Co., La Porte, Ind. Fig. 13 shows a style adapted for use in tying the sides of joists. Fig. 14 shows a type of anchor suitable for use on the top of a joist, and Fig. 15 illustrates these anchors in use. Figs. 16 and 17 show improved pin anchors. The point is made that this device is economical and most effective and is used by leading builders throughout the country.

Ambler Asbestos Built Garages

The attention which is being given at the present time to garage construction lends added interest to a very attractive pamphlet or catalog entitled "Ambler Asbestos Built Garages" which is being distributed by

(*Continued on page* 34)

GOODELL-PRATT



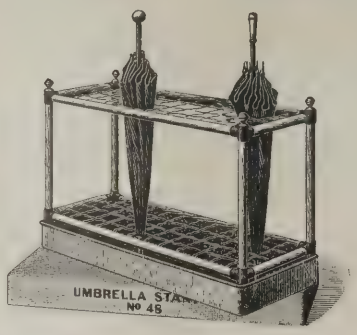
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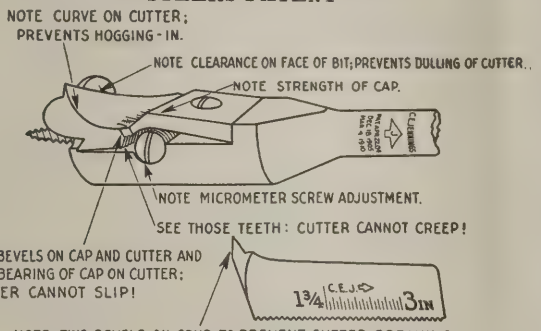


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C. E. Jennings ARROW HEAD Expansive Bit

STEERS PATENT



C. E. JENNINGS & CO., *Sole Manufacturers*, 71-73 Murray St., N. Y.

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Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

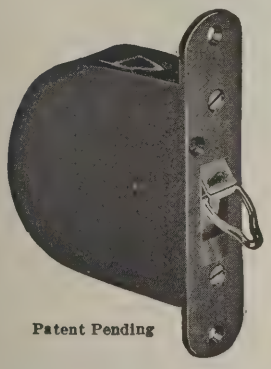
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CALDWELL SASH BALANCES UNIFORM MORTISES



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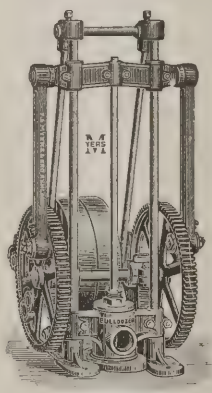
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For Suspending Heavy Doors Gates, Etc.

All of SUPERIOR QUALITY



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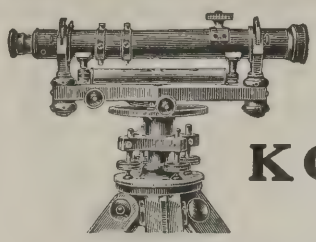
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to cut out guesswork—to know your work is error-proof.

Then buy a

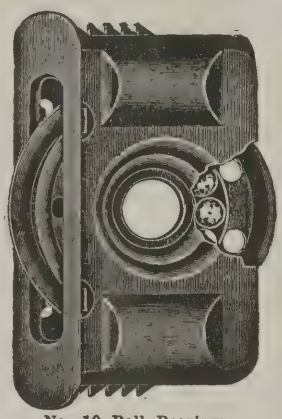
KOLESCH

Builders' Level

Kolesch Levels are built right, and stay right. They are light in weight, will stand hard usage, and are sold at a reasonable price.

Send for full particulars TODAY

Kolesch & Company, 138 Fulton Street NEW YORK



No. 10 Ball Bearings

"Grand Rapids" All Steel Sash Pulleys

Fasten automatically. No nails. No screws. Just bore 4 holes.

The automatic saw tooth fastening feature and the easily made mortise will save in labor the cost of the pulleys.

Frictionless, Noiseless, Everlasting.

Write for free samples.

Grand Rapids Hardware Co.
160 Eleventh Street, Grand Rapids, Mich.



Weatherproof Corners

That's what you get when you finish a house with

KEES METAL
Building Corners

They take the place of corner boards with lap siding. Give the popular mitred corner effect without the slow, expensive work of beveling the siding. Save time and money.

Write for samples. If you like, we'll also send samples of Kees Siding Clips, which make tight joints where siding joins casings or corner strips.

Let us also send you Free samples of Kees-Gossett Window Screen Hangers.

F.D. KEES MFG. CO. BEATRICE, NEB. Box 812

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞, weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-888 Progress St. Pittsburgh, Pa.

the Keasbey & Mattison Company, Ambler, Pa. The little work is illustrated by means of half-tone engravings of garages in various sections of the country and the roofs of which are covered with Ambler asbestos shingles of the "Century" brand. In regard to these shingles it may be stated that they are made from a scientifically accurate mixture of Portland cement and strong asbestos fiber, thus giving both the protection and strength of asbestos combined with the great strength and indestructibility of cement. The mixture is made with great care, the fibers of asbestos running in every direction, crossing and recrossing in such a way as to form a firm matted foundation for the cement colloids. This interlacing of the fibers is said to overcome the possibility of graining, consequently it is claimed the shingles cannot warp, chip or split. This pasty mass of asbestos and cement is then rolled out to shingle thickness and the water extracted under great pressure, the shingles being pressed flat and absolutely smooth. This pressure removes the air pockets and the small holes where water or moisture could settle. They are then allowed to season thoroughly. In connection with the illustrated matter is a long list of garages which are covered with Ambler asbestos shingles. The last page is devoted to facsimiles of the three colors in which these shingles are made.

Marsh-Capron Rail Track Mixer

One of the features of concrete mixers made by the Marsh-Capron Manufacturing Company, 1462 Lumber Exchange Building, Chicago, Ill., is the idea of placing steel rail tracks of the quality of railroad rails around

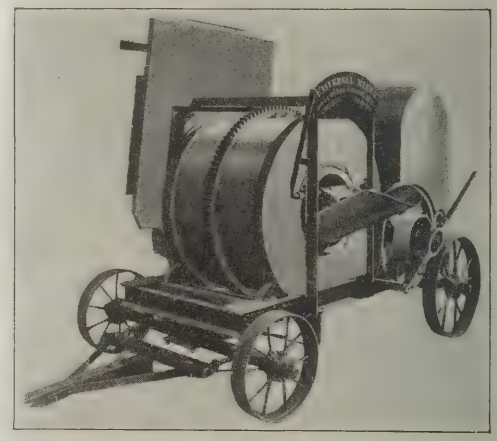


Fig. 18—Marsh-Capron Rail Track Mixer

the mixer drums, which is claimed to secure a track much superior to one made of cast iron. These rails are used on all the five sizes of concrete mixers manufactured by the company, as well as three sizes of pavers. The rails are said to never wear scallopy, to insure easy running, and to be worthy of careful consideration from every buyer. The appearance of one of these mixers is shown in Fig. 18.

Lansing Equipment for Contractors

An interesting catalog entitled "Lansing Equipment for Contractors" and which illustrates and describes various types of mixers made by the company including mixers with power side loader, water tank and gasoline engine, also with steam power of various styles; mixers with standard wheelbarrow hoppers, batch charging hoppers, etc., has just been issued by the Lansing Company, 21 Cedar Street, Lansing, Mich. The latter part of the catalog is of especial interest to

(*Continued on page* 36)



Roofed Throughout With Bayonne Roof and Deck Cloth

Gedney Farm Hotel,
White Plains, N. Y.
Kenneth M. Murchison, Architect

And you know it will retain its water-and-weather-proof quality for years and years of service. You know Bayonne can never crack, peel or rot, that it "stands up" better than ordinary canvas, and is better all around than metal roofing.

All builders know that

Bayonne Roof and Deck Cloth

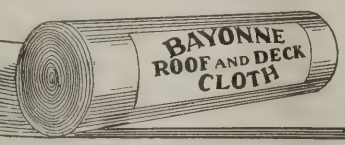
is value clear through. They know that it costs less in the first place—and in the long run. They know that its special process of manufacture means long service even with hard usage.

When you use Bayonne you don't have to worry about the high cost of paint. Bayonne isn't laid in paint. It's laid on DRY BOARDS—and only requires a light coat of paint afterwards. This means no bubbles—no buckling—less labor.

Bayonne is the standard for roofs and decks of sun-parlors, sleeping-porches, piazzas—on all places receiving hard wear.

Send for Price Book D and examine the close weave of the samples

JOHN BOYLE & CO., Inc.
112-114 Duane St.; 70-72 Reade St., New York City
Branch House, 202-204 Market St., St. Louis, Mo.





Quiet, Comfortable and Cosy Within

ALTHOUGH THE STORM RAGES WITHOUT

CON-SER-TEX is a specially treated high-grade cotton fabric particularly well adapted for roofing and porch covering. It will not rot, stretch, crack nor blister. No more noise and rattle when the elements let loose. No more leaky spots after the storm has passed. CON-SER-TEX preserves the coziness and safety of the home during the storm.

Every carpenter, builder and owner should send for our new illustrated booklet "Roofing Facts and Figures." It proves the many advantages of CON-SER-TEX Canvas Roofing.

WILLIAM L. BARRELL COMPANY
8 Thomas Street New York City
Chicago Distributor: Geo. B. Carpenter & Co., 430-40 Wells Street.
California Distributors: Waterhouse & Price Co., Los Angeles; The Pacific Building Material Co., San Francisco.

A Perfect Piece of Brickwork

It is unnecessary to argue that beauty and attractiveness in brickwork are desirable. In the first place it is a standing advertisement for the builder.

To build for artistic appearance as well as permanency you should be as careful in selecting the quality and color of the mortar color as you are in the selection of the face brick.

Especially is this so with high-grade brick and wide joints, the joints taking up as much as one-quarter of the entire area.

Clinton Mortar Colors

emphasize the beautiful face brick and are absolutely permanent.

They will not fade out and are the cheapest in the long run.

Let us send you suggestions, samples and prices.

Clinton Metallic Paint Co.
Franklin Avenue Clinton, N. Y.





Look to the future of your roof

Will your roof come to an early end—attended by leaks and repair bills?

Or, will it give you many long years of service?

YOU answer these questions when you buy the roofing.

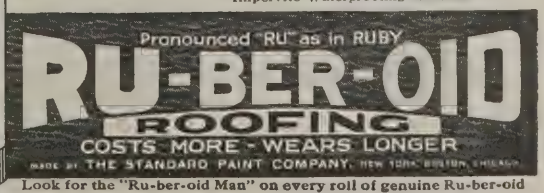
RU-BER-OID, the long life roofing lasts for years and years and saves repair bills *because it contains nothing that can crack, warp, rot, run, rust or leak.*

The "Ru-ber-oid Man" is on every roll of REAL RU-BER-OID.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete





Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid

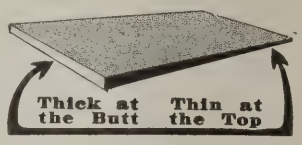
Winthrop Tapered Asphalt Shingles
Only Kind Tapered Like Wood

THE PUBLIC LIKES THEM

Many Contractors have discovered what E. S. Lindsay, Contractor and Builder of Parnassus, Pa., found out, as shown by his letter:

"I am very much pleased with the Tapered Shingles I purchased from you. They seem to appeal to the general public. I would like to have the agency for them."

Ask for a sample shingle.



THE BECKMAN-DAWSON COMPANY
ASPHALT SHINGLES
Factory: Argo, Ill. 1400 Association Bldg., Chicago, Ill.

60 Seconds Makes This Change

TRADE STEEL BUTLER PRODUCTS MARK

Folding Truck Body

60 seconds converts the Butler Body from an attractive roadster into a substantial, serviceable light delivery wagon. Easily attached by any one in a few minutes. Write nearest factory to-day for literature showing prices, also other styles of bodies.

BUTLER MFG. COMPANY
897 Butler Bldg., Kansas City, Mo.
852 6th Avenue, S. E. Minneapolis, Minn.



30 SECONDS MAKES THIS CHANGE



Buy An Engine

On Your Own Terms.

30 Years of success in making and selling high-grade engines enables me **now** to sell direct to the user on practically his own terms. Any worthy, creditable man anywhere in the U. S. can accept my offer, and be sure of a **reliable** engine at direct from factory prices.

Ed. H. Witte

WITTE ENGINES



High-Grade

are made in sizes 2, 3, 4, 6, 8, 12, 16 and 22 H-P. —Kerosene or Gasoline. Particularly adapted for farm and shop. Hundreds in use in every state. My Free Book, "How To Judge Engines," explains fully what you should know before buying.—ED. H. WITTE, Pres.,

Witte Engine Works 3199 Oakland Ave., Kansas City, Mo. 3199 Empire Bldg., Pittsburgh, Pa.

In every summer cottage you build



—you can install, *at a profit*, a

Ro-San Indoor Closet

Every building—home, cottage, store or office—that has no sewer connection needs this modern sanitary indoor closet. Absolutely odorless. Act as our agent—this fixture sells easily to your customers—good profit. Hundreds of carpenters represent us. We also distribute through builders the

Ro-San Washstand

Provides Running Water, Hot or Cold, Without Plumbing. Every housewife wants one Convenient, sanitary. Sells readily with little effort. Carry this work along with your regular business. Ask for terms to agents.

Absolutely Odorless. Sold on a Real Guarantee.

ROWE SANITARY MFG. CO.
603 Sixth Street Detroit, Mich.

the builder who is desirous of thoroughly familiarizing himself with the mixer he is either using or is intending to use. A full-page plate shows the truck, frame and traction of the Lansing paver and numerous other illustrations show the exterior and interior of various details of the mixers made by this company such as the mixing drum, frame and rollers, friction loader clutch hoist, main clutch, etc. Detailed specifications of these various types of mixers are also contained together with line drawings which illustrate all their working parts. Of interest also are the illustrations of continuous mixers and mortar mixers, wheelbarrows, drag scrapers, wheel scrapers, concrete carts, material elevators, etc. A table gives the sizes and capacities of Lansing mixers.

New Officers of Sargent & Company

At the annual meeting of Sargent & Company held in New Haven, Conn., on May 17, officers for the ensuing year were elected as follows:

President .....Henry B. Sargent
Vice-President .....G. Lewis Sargent
Secretary .....Murray Sargent
Treasurer .....Ziegler Sargent

New directors were elected in Wilfred Lewis and Ziegler Sargent and the following members of the Board of Directors were re-elected: Henry B. Sargent, Edward R. Sargent, Joseph D. Sargent, G. Lewis Sargent, John Sargent, Bruce Fenn and George F. Wiepert.

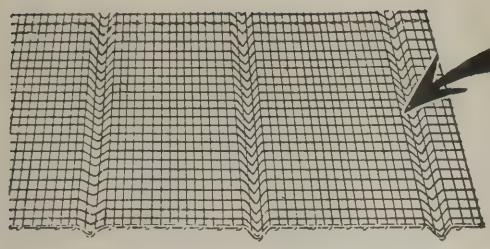
The "Standard" Concrete Mixer

The increasing popularity of the low charging type of concrete mixer will render of interest the latest catalog of The Standard Scale & Supply Company, 1345 and 1347 Wabash Avenue, Chicago, Ill., and entitled "Catalog Y-159. This states that the distinctive feature of "The Standard" is a mixer of the batch type and of low charging, compact design, in which, by the use of an annular row of diagonal blades attached to the interior periphery of the drum at the charging end, material is forwarded into the mixing portion of the drum and retained there as the drum rotates, or during the mixing operation. This unique patented design permits the use of a low charging platform, about 2 ft. from the ground, and short, slightly inclined runways for wheeling material direct to the mixer. It makes unnecessary the use of tilting or skip loaders with the complicated mechanical contrivances and extra man required for their operation. Illustrations and descriptions of the various styles of mixer are also presented in the catalog.

Majestic Coal Chutes and Building Specialties

Some interesting information relating to the Majestic coal chute, is contained in a booklet just sent out by the Majestic Company, 504 Erie Street, Huntington, Ind., and entitled "Majestic Coal Chutes, Garbage Receivers and Building Specialties." The coal chute is so arranged that when opened a hopper keeps the coal from falling on the grass and a steel shield covers the glass of the window, likewise protecting the side of the house. Another interesting convenience described is a Built-in Kitchen Garbage Receiver, which permits the garbage to be emptied from the kitchen into it, and allows removal from the exterior by the garbage man. A Milk Bottle and Package Receiver is described, and this consists of a pocket in the wall; the milk or package is placed in this pocket, and the outside door automatically locks as it closes, and the contents are

(*Continued on page* 38)



ELIMINATES FURRING

GRIMM'S GALVANIZED CORRUGATED WIRE LATHING

The V-Shaped corrugations keep the lath clear from the wall and form a dry air space. These corrugations make the lath stiff and rigid without adding excess weight. It is galvanized after weaving and therefore cannot rust. DURABLE and ECONOMICAL.
Write for our special booklet 61-F on wire lathing—Gratis.

BUFFALO WIRE WORKS CO., (Formerly Scheeler's Sons)
446 TERRACE, BUFFALO, N. Y.
Branch Office and Warehouse
9-11 So. 7th St., Phila., Pa.

SYRACUSE
NOROL SERIES
NAIL SETS

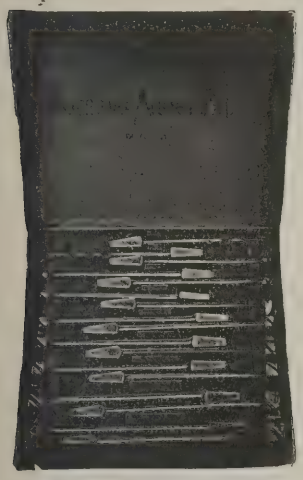
Square body—positively will not roll. Knurling full and clear. Corners rounded to prevent injury to fingers. Cupped points tested on steel and fully warranted.



Sent postpaid on receipt of 12c. if your dealer can't supply you.
Syracuse round body sells for 10c.

12c

Syracuse Twist Drill Co.
Syracuse, N. Y.

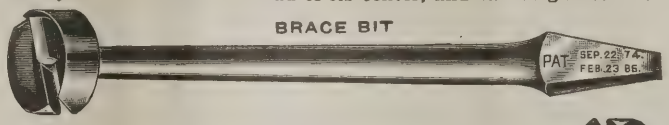


THE "FORSTNER" LABOR SAVING AUGER BIT

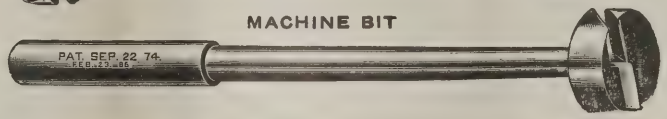
BORES ANY ARC OF A CIRCLE

As it is guided by its circular rim instead of its center, and can be guided in any direction.

BRACE BIT

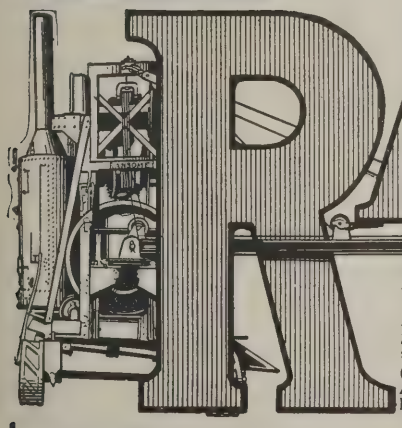


MACHINE BIT

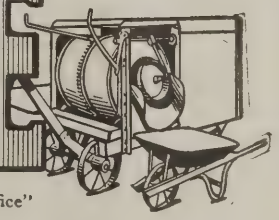


Unequalled for fine carpenter, cabinet and pattern work. Specially adapted for hard wood working and against difficult grain and knots. Special prices in full sets.

THE PROGRESSIVE MFG. CO., Torrington, Conn.



RANSOME



"Registered United States Patent Office"

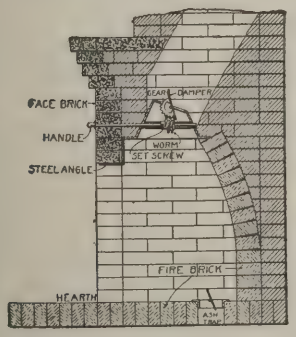
Well Mixed Concrete for Permanence—Ransome for better mixing
(Member National Association Mixer Manufacturers)

The STANDARD machinery in concrete mixing, paving, handling or placing and in the manufacture of power equipment, engines and boilers. CIRCULARS and information on application. The most complete, the largest and the oldest concrete machinery manufacturing concern in the world—everything from sand piles to forms.

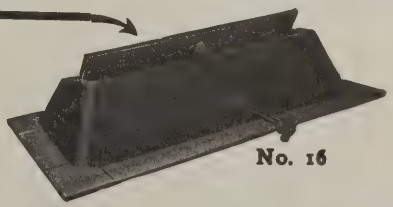
RANSOME CONCRETE MACHINERY CO., Dunellen, N. J.

Chicago Office: 208 N. Clinton Street — San Francisco Office: 931 Hearst Building — Executive Offices: 115 Broadway, New York City

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Improved Fireplace Dampers



No. 16

Stover dampers make the building of fireplaces easy. The labor saved by their use reduces the cost considerably.
Catalog 1590-x describes these and other new style dampers in detail, gives valuable suggestions as to fireplace construction and shows a large assortment of other fireplace fixtures.
If you build fireplaces, send for this catalog. **It's free.**
We manufacture builders' and household hardware, wind mills, feed mills and gasoline engines.

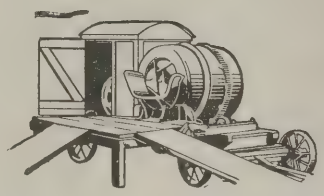
STOVER
Mfg. & Engine Co.
Freeport, Illinois

Stover Mfg. & Engine Co., 747 East St., Freeport, Ill.
Send us Catalog 1590-X.

Name ..... Business .....

City ..... State .....

"The Standard" Low Charging Concrete Mixer



Cuts Costs—Increases Production

Contractors all over the country have found that "The Standard" Low Charging Concrete Mixer actually reduces concrete costs one-third.

Send for our latest catalogue, which is full of interesting pictures and data. Just write to our nearest office to-day for your copy. Ask for catalogue No. 48.

The Standard Scale & Supply Company

PITTSBURGH—1631 Liberty Ave.
NEW YORK—145 Chambers St.
PHILADELPHIA—523 Arch St.
CHICAGO—163 N. May St.
CLEVELAND—1547 Columbus Rd.
BALTIMORE—409 N. Gay St.

"Most Mixing—Least Fixing"



The "Universal"—Easy to Charge, a Fast and Thorough Mixer.

Marsh-Capron Mixers

The Marsh-Capron Line includes seven sizes of mixers, three sizes of pavers, and the Marsh-Capron Grouter. Get full data on the Marsh-Capron Universal Mixer. This one-bag mixer has a capacity of 7 cubic feet of mixed concrete, or 11 cubic feet of loose material, as rated by the National Association of Mixer Manufacturers. It is sturdily built, compact, rapid, low charging, trouble proof—a mixer that will give you years of service, better mixed concrete, less trouble, than anything of its type now on the market—and at less cost for both mixer and concrete.

Marsh-Capron Manufacturing Co.
1462 Lumber Exchange Building, Chicago

Member of the National Association of Mixer Manufacturers
Our Mixers rated by the N. A. M. M. Wet Batch Rating

thus safe until removed through the inside door. Other interesting things are also described, and include the Majestic Duplex Heating System for Residences, in which the advantages of the Duplex Register are described in connection with the Majestic pipeless furnace; ash pit or flue clean out doors, cast iron flue thimbles, porch column bases, all metal plant boxes, etc.

Neponset Twin Shingles

In view of the vast amount of property that is destroyed each year by fire and the advantages of fire-resisting roofs, Bird & Son of East Walpole, Mass., call attention to the advantages of Neponset Twin Shingles. Reference is made to the attractive appearance of these shingles, the statement being made that their red and green slate surfaces blend with any architectural plan or surrounding. Durability is another feature to which attention is called and the manufacturers state that it is the great wearing qualities of these shingles that have earned for them the title of "The Roofing Development of the Twentieth Century." Those among the readers of THE BUILDING AGE who are interested in knowing more about these shingles can obtain a copy of a booklet on the subject by sending to the address given.

A New Butt Gauge

A butt gauge made by E. C. Stearns & Company, 114 Oneida Street, Syracuse, N. Y., is illustrated and described in the literature which this company is distributing. Some of the features of the gauge are that the bars cannot fall out and thus become lost. One of the bars has a steel point or cutter at either end which enables the outer cutter to be set for gauging the edge at the door while the cutter on the other end gauges the distance from the back of the jamb. The other bar has a cutter on the end for gauging the thickness of the butt. The company is also distributing matter relating to the Stearns saw filing guide and vise by the aid of which, it is claimed, saw filing is made so easy that even a novice can file a saw. A ball and socket joint allows favorable adjustment to light while filing and holds the file properly at the necessary angles, there being three rigid positions at which the file may be held. The vise has 10½ in. planed jaws which hold the saw firmly.

Quantities of Material Required in Concrete Construction

"Tables Giving the Quantities of Material Required in Concrete Construction" is the title of a pamphlet containing valuable tables of figures which are constantly useful and handy for ready reference. There are given points to be observed in concrete construction, waterproofing, etc.; proportions of cement, sand, and crushed stone for concrete; tables giving quantities of cement required for definite volumes of concrete, for cement plaster or cement mortar, for concrete floors, etc. A copy may be obtained by addressing the Sandusky Cement Co., 624 Engineers' Building, Cleveland, Ohio.

American Universal Floor Surfacer

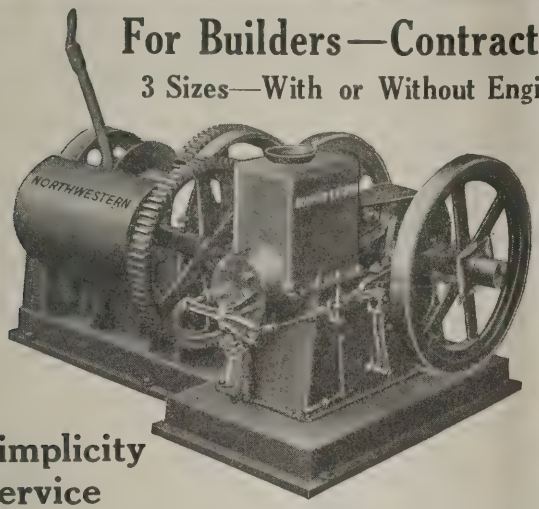
There has just been issued from the press a new catalog of the above-mentioned machine and setting forth those details in which the builder is likely to be interested. The machine in question is adapted for use on all kinds of woods and as a consequence, many contractors who have purchased a machine for their own work have found it easy to obtain much of the surfacing work they wanted from other contractors in their

(*Continued on page* 40)

Economy Hoists and Engines

For Builders—Contractors

3 Sizes—With or Without Engine



Simplicity
Service
Satisfaction

Write for Bulletin No. 6
For Full Particulars

Northwestern Steel & Iron Works

"The House of Good Service"

Capital $200,000.00 Eau Claire, Wis.

"NORTHWESTERN"

Ask For Bulletin No. 37 on Mixers
Saw Rigs, Tile and Culvert Forms



Lansing No. 5 "Half-Sack" Batch Mixer

A money maker for sidewalk construction, curbing, small foundations—in fact any job not requiring over 30 or 50 cubic yards per day.

Costs little to run, little to buy and effects a big saving.

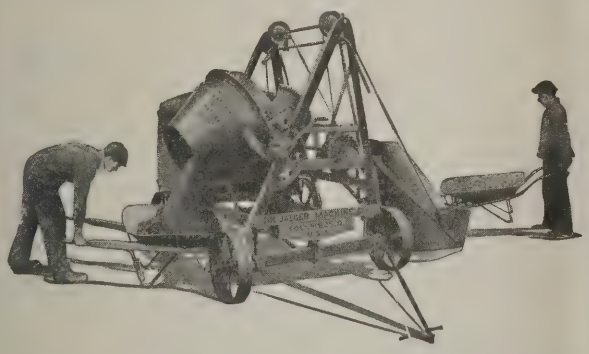
Furnished with Loader, Tank, Silo Hoist, Batch Hopper, etc.

Write or wire for details.

LANSING COMPANY
"KEEP YOUR PRODUCT ON WHEELS"

21 Cedar Street, Lansing, Michigan

Warehouses: Chicago, 167-169 W. Lake St.; New York, 288-90 West St.; Philadelphia, No. American and Willow; San Francisco, 338-48 Brannan St.; Kansas City, 1413-15 W. 10th St.; Boston, 78 Cambridge St., Charlestown District; Minneapolis, 517-19 Third St. No.



No Job Too Big or Too Small

for this handy little mixer. Saves its price in time on one job of mixing.

Big-an-Litle Mixers

3 Sizers—14 Styles

A portable mixer built for hard work. An indispensable machine for the large or small contractor. Mixes concrete, mortar or plaster and equipped with hoist if you want it. Latest revolving drum and other features too numerous to mention here.

Write for details.

The Yaeger Machine Company

216 West Rich Street Columbus, Ohio

"Tell 'em it's 'O.K.' all right,"

Says Mr Ralph Sollitt of Ralph Sollitt & Sons Co. CHICAGO, ILL.

A GOOD STRONG MIXER CAPABLE OF TURNING OUT CONCRETE AT FASTER RATE THAN YOU HAVE BEEN ACCUSTOMED TO AND ONE THAT IS SO SIMPLE IT IS ALMOST OUT OF THE QUESTION TO CAUSE TROUBLE.

JUST THE MIXER YOU WANT FOR USE ON THAT FOUNDATION, SIDEWALK, SCHOOL HOUSE, AND OTHER CONCRETE WORK. WE BUILT HUNDREDS OF THESE MACHINES THIS WINTER SO AS TO GIVE THE CONTRACTOR A MIXER WHEN HE WANTED ONE.

SEND FOR FOLDER ON MIXER AND ALSO BOOK "FACTS AND FIGURES" FOR THE CONTRACTOR.

OSHKOSH MANUFACTURING COMPANY

72 Buck Street

OSHKOSH, WIS.





FOR ANY HOME

For any home, from a bungalow to a mansion—in fact, for any building, there is no exterior building material so adaptable, so economically durable as time-defying, beautiful, complaint-proof

KELLASTONE
IMPERISHABLE STUCCO

In every climate, on buildings of every type, in factories, schools, hospitals and U. S. Government buildings, Kellastone has demonstrated its ability to overcome the defects of other stuccos and the drawbacks of other exterior building materials.

Let us send you our illustrated book, "The Story of Kellastone," which will show you why Kellastone does not crack, check or fall off, how it resists fire, water and weather and the results of changes in temperature. It will be to your profit to know about it.

The National Kellastone Co.
1317 Mallers Building Chicago, Ill.



VAN GUILDER DOUBLE WALL CONSTRUCTION

Built Like a Thermos Bottle

with double monolithic walls from footing to roof plate, tied together and reinforced, and continuous air space everywhere.



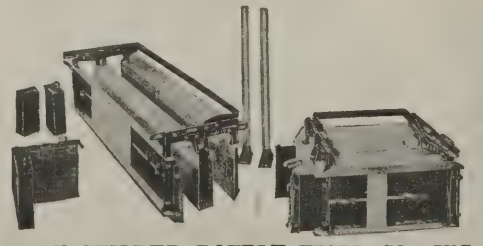
The Van Guilder Double Wall Concrete Machines

lower the cost of construction by eliminating the making and rehandling of materials, and economize on skilled labor.

The Immediate Releasing System permits the work to go on continuously—no waiting for concrete to set.

Our literature is packed with profitable information. It also shows the machines for building Ice Houses, Silos, Cold Storage Plants, etc.

Copies sent you on request.



THE MACHINE

VAN GUILDER DOUBLE WALL CO., INC.
20 Wagner Bldg. Rochester, N. Y.

locality at profitable prices, while some owners of machines have made a regular business of floor surfacing, taking the work under contract. The "American Universal" is built in one size only having a sanding drum 12 in. wide, the makers having adopted this size of single roll machine because of its practical nature for general floor work. The claim is made by the American Flooring Surfacing Machine Company, Toledo, Ohio, that a machine of this kind can do the work of several men and do it with greater satisfaction. The machine not only surfaces new floors, but it is stated will resurface old floors, removing varnish, paint, shellac, wax, etc., that makes them look like new. The capacity of the machine depends, of course, to a large extent upon the condition of the floors and the quality of the finish desired. It is said the machine will surface per day from 4000 to 7000 sq. ft. of flooring once over, or completely finish from 2000 to 3000 sq. ft. per day.

Flat Slate Roofs

Many of our readers will be interested in the statement that flat slate roofs have been in use for a number of years and are said to have given entire satisfaction. The impression sometimes prevails that slate is not adapted for flat roofs and with the idea of refuting this impression, the North Bangor Slate Co., Bangor, Pa., is distributing a booklet entitled "Flat Slate Roofs," which aims to show that flat slate roofs have stood the test of time and uphold the record for durability, economy and general satisfaction that has given Genuine Bangor Slate its reputation. The booklet contains numerous illustrations of buildings with flat slate roofs and also testimonials from architects, roofers and owners as to the value of this type of roofing. The slate is laid with no lap, thus making the cost of the slate less than that of steep roofs. It is said that, when properly laid, a flat slate roof can be walked on and will bear traffic. The specifications of a prominent architect who has had over 25 years' experience with slate roofs is contained in the booklet as follows:

"See that the roof surface or sheathing is as even and smooth as possible.

"Then cover the sheathing with one layer of sheathing paper, weighing ten pounds to the square, single thickness.

"Upon this lay four plies of best all wool roofing felt, weighing sixteen pounds to the square, single thickness, well mopped the full width of the lap with hot pitch and asphaltum.

"This composition should be a thorough mixture of about 60 per cent pitch and 40 per cent asphaltum. The mixture of asphaltum with the pitch will prevent it from running in hot weather.

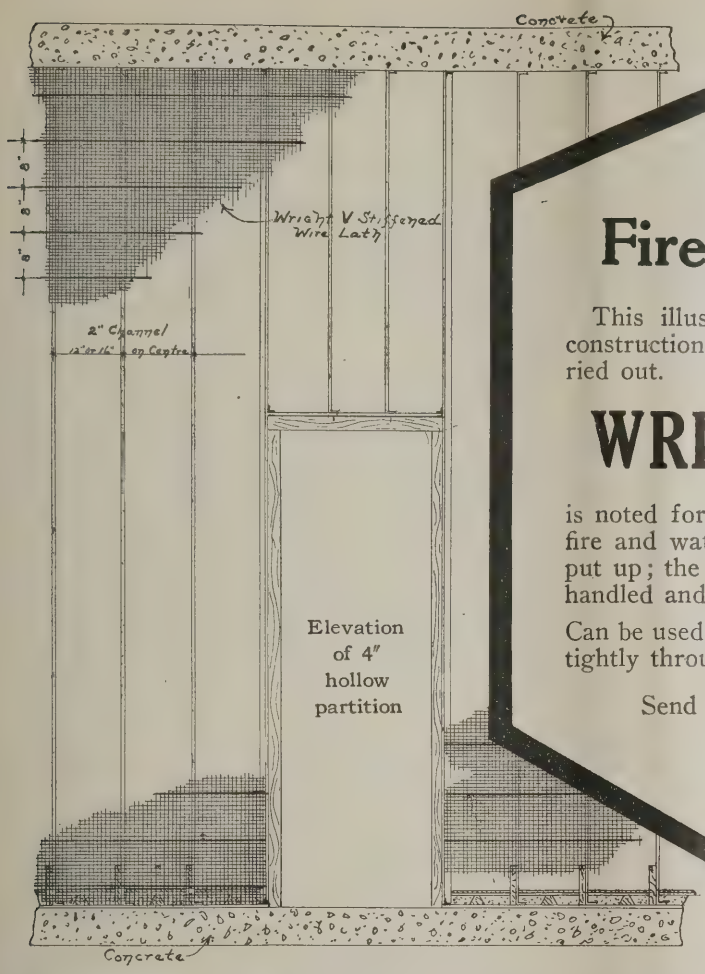
"After the felt is laid, mop the entire surface with this composition, and while it is hot, embed in it solidily Genuine Bangor Slate.

"Before applying the slate see that they are perfectly dry in cold weather, and of normal temperature, so as not to chill the mixture in which they are embedded."

"Fireplace Fixtures"

Interesting information concerning features which may be utilized in the direct construction of a fireplace, such as dampers, etc., is contained in catalog 1590-X, entitled "Fireplace Fixtures" and issued by the Stover Mfg. & Engine Company, Freeport, Ill. It is undoubtedly true that every fireplace should be provided with a damper for the purpose of conserving the fuel by regulating the draft, by permitting a greater use of the heat, and to facilitate the mason's work in the formation of the throat. An improved style of damper illustrated in the catalog will therefore prove of interest. It is of such a nature that the rod can be instantly adjusted to any length by loosening the set screw in the worm.

(*Continued on page 42*)



Every Partition Should Be Fireproof Construction

This illustration shows how this can be done. Such construction is the modern, safety-first idea properly carried out.

WRIGHT WIRE LATH

is noted for its strength, rigidity, and durability; its time, fire and water-defying qualities; the ease with which it is put up; the strong and even selvage which makes it easily handled and tied together.

Can be used with either iron or wood furring. Plaster keys tightly through to the back side.

Send for booklet X, architect's service sheets, and further information.

WRIGHT WIRE CO.
WORCESTER, MASS.



Convenience and Speed In Hauling

Turn Your Pleasure Car Into Profit

Make your automobile pay its expenses. Use it on the job. Make it do the work of a team of horses and at less expense. Speed up your building contracts by using the

Rogers All-Steel Trailer

It will help increase the efficiency of your business.

Made in several styles and sizes—dump cars and lumber carriers. Write for full information.

ROGERS BROTHERS COMPANY, ALBION, PA.

MUELLER PIPELESS FURNACE

Will Make Big Money for You

YOU can make big money for yourself and insure complete satisfaction to your customers by installing the **Mueller Pipeless Furnace** in new and old houses. The big demand for the **Mueller Pipeless Furnace** has opened a new field of profits for contractors, builders and furnace men. Thousands of dwellers in stove heated homes are having it installed. It is also a practical, efficient and decidedly economical method of heating modern homes of medium size. You can install it in one day.

The **Mueller Pipeless Furnace** is dominating the "single register" heating field because it possesses the unequalled heating efficiency and fuel economy of the nationally known Mueller Warm Air, Hot Water, Steam and Vapor Systems, and has behind it the sixty years' reputation of the L. J. Mueller Furnace Company. It is a **real** furnace, of exactly the same construction as the old reliable Mueller line, but without **pipes** or flues. It heats the whole house comfortably, cleanly, economically and dependably from **one** register. Burns hard or soft coal, coke or wood. Saves 35% in fuel.

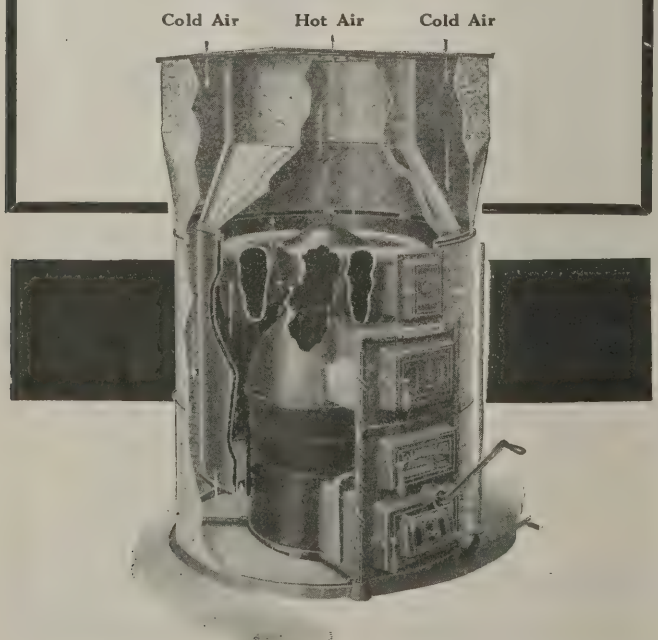
Extensive advertising has made the **Mueller Pipeless** well known. Contractors, builders and **furnace** men everywhere are profiting by the **big** demand. Get in on this now and get your **share.** Write at once for our proposition.

L. J. Mueller Furnace Co.

220 Reed Street, Milwaukee, Wis.

Makers of Heating Systems of All Kinds Since 1857

Consult, free, our expert service bureau on all your heating requirements—get our estimate on all your heating installations



The operation of the cover is claimed to be positive and easy while the knob or handle has a wide flange to cover the opening in the brickwork and is marked so that the operator knows what direction to turn the knob to open or close the damper; the side of the frame at the end of the dome is exceptionally wide, thus enabling the mason to readily arrange the angle of the side walls of the damper. Added interest is lent to the description by the illustrations, which include elevations and cross sections showing the damper in position. Ash trap doors, fire baskets, fireplace sets, andirons and other features which can be utilized in connection with a fireplace are also illustrated and described, the prices of each being given.

Some Uses of Bishopric Stucco Board

In addition to its use as a base for stucco, the manufacturer points out that Bishopric Stucco Board has many other applications which are equally valuable to the builder. It is pointed out that the non-creosoted board is being extensively used for inside plastering in place of the ordinary lath, as with the heavy fiber board backing which is given a heavy coat of asphalt mastic, it makes a good sound-deadener, thus producing a much warmer house than would otherwise be the case. It is also claimed to render the house damp-proof as well as vermin-proof and at the same time the material is a fire-retardant. In the renovating of old frame houses, the board is also serviceable and is extensively used for this purpose, it being a very simple matter to transform an old clapboarded house into an attractive stucco dwelling and at the same time add to its warmth. In using the stucco board for this purpose, it is applied directly over the clapboards with the lath in a vertical position and by using four 6d nails to each lath a perfect base for stucco is said to be secured. Still another application that is interesting is its use back of brick veneer and in this connection is said to overcome the troubles and complaints which have often been urged against the dampness and coldness of many brick-veneer houses. By the use of this board with its dovetailed lath, a perfect tie for the brick is said to be obtained as the cement-mortar is worked into the "keyed" lath and ties the brick veneer more securely than would otherwise be the case. The Bishopric sheathing is used for sub-flooring and under clapboards and shingles in the place of ⅞ in. sheathing and paper, the claim being that it is more economical while at the same time giving a more rigid and warmer house. For use as a sub-floor it is claimed to give a waterproof floor that is a non-conductor of sound and cheaper to lay than the ordinary ⅞ in. sub-flooring. For roofs, under shingles, it gives a tight construction and the lath being laid facing the shingles gives an air space so that much of the usual heat of the attic in summer is avoided thus adding to the comfort of the entire house. Interesting literature on the subject may be obtained from the Bishopric Mfg. Company, 913 Este Avenue, Cincinnati, Ohio.

Appendix to Book of Standards

An appendix to the 1913 edition of the Book of Standards, published by the National Tube Company, Pittsburgh, Pa., has recently been issued. The appendix contains data compiled since 1913, and is also provided with an index covering both the early edition and the appendix.

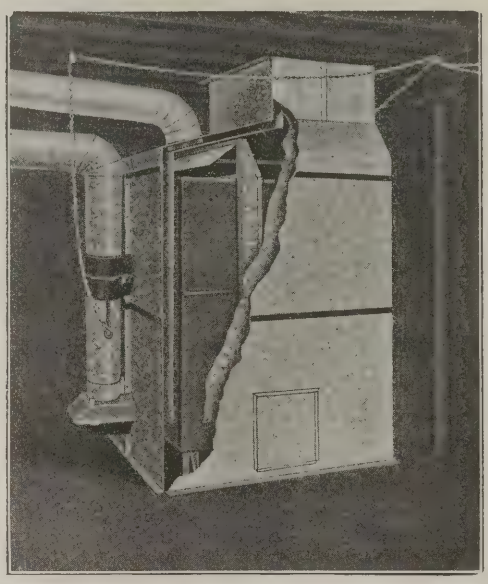
Publicity for Red Cedar Shingles

The shingle campaign which has been carried on during the past year by the shingle branch of the West Coast Lumbermen's Association, is being reflected throughout the northwestern states of the country, and

(*Continued on page* 44)

The Hess Welded Steel Pipeless Furnace

is efficient, economical, and in every way satisfactory for heating cottages, bungalows, and single large rooms, such as churches, schools, stores, etc. We do not consider it the best type for heating houses where there are a number of detached rooms to be heated separately. For such houses we recommend our regular pipe furnace. **We have improved the pipeless method,** however, so that it is perfectly adapted to heat the pipeless way, and also to heat one or two detached rooms, by means of an extension of the heat chamber, and separate pipes for such detached rooms. This improvement is indicated in the cut, and a patent has been allowed upon it. It is entirely satisfactory, and places the **Hess Pipeless Furnace** in a class by itself. Write us for a solution of your heating problems, and our estimate for your work. We make special terms to contractors, and enjoy the patronage of very many, in all sections of the United States, whose repeated orders indicate the satisfaction they receive from **Hess Furnaces.**



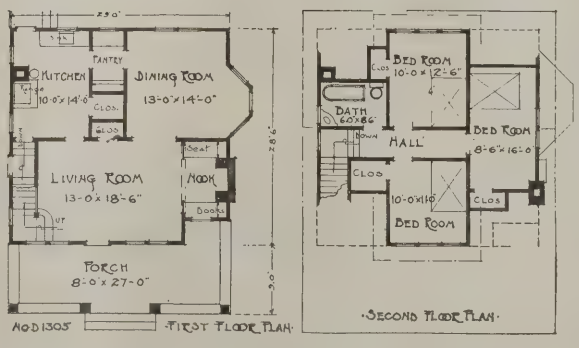
HESS WARMING & VENTILATING CO.

1201 Tacoma Building, Chicago, Ill.

P. S.—The furnace supply this year will be less than normal. Material is scarce, railroad service is slow, mechanics are joining the army, and this combination of circumstances leads us to urge our friends to anticipate their furnace wants and order early.

KEITH'S Artistic Ideas FOR THE BUILDER





Design D 1305 from "Keith's"

You can build beautiful homes like these just as easily as the ordinary kind, and if you put character into your work, the business will come to **you.**

We devote our time, ability and experience to designing, planning and showing "how to do it right," and offer to send you **KEITH'S MAGAZINE on Home Building,** 17 years the well-known magazine for builders' for a year (12 numbers) and **your choice of any two of Keith's famous plan books for $3.00. Keith's** for 17 years has held the reputation of being the recognized authority on building artistic homes that sell. Yearly subscription with one book, $2.50.

OUR BIG OFFER gives you 12 months numbers with your choice of any 2 books

130 Plans for Bungalows
104 Plans for Cottages
100 Plans for Homes of Cement and Brick
125 Plans for Homes costing below $4,000
175 Plans for Homes costing below $5,000
50 Plans of Garages
175 Plans for Homes costing below $6,000
125 Plans for Homes costing over $6,000
40 Duplex Houses and Flats

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M. L. KEITH, 700 McKnight Building, Minneapolis, Minnesota



Flies, Germs, Garbage Cans

do not enhance the value of your building, bring higher rentals or promote tenant comfort. These drawbacks are eliminated and greatest sanitation fostered by

The Incinerite
IT SOLVES THE PROBLEM

—the *original*, gas-fired incinerator. Now in daily use in thousands of homes, apartments, hospitals, institutions. Destroys all waste matter by incineration, burning artificial, natural or gasoline gas. Low cost.

Write for booklet, "The Invisible Garbage Man," picturing various models, installations, etc. Blueprints showing installations of Wall Type Incinerite on request.

E. C. STEARNS & CO.
114 Oneida Street SYRACUSE, N. Y.

HERO
Pipeless Furnace

A real money maker and business producer for live contractors and builders. The "Hero" has only one register; no pipes. It is easy to install—less trouble—less expense.

By sending us your floor plans you can have the benefit of our expert heating knowledge and we will suggest the proper and most economical heating method. This service is free—no obligation on your part.

Write for catalog B and our special proposition to contractors and builders to represent us in exclusive territory. Big commissions.

Charles Smith Company
57 W. Lake St. Chicago, Ill.

Northwestern Distributers:
Central Supply Co., Minneapolis, Minn.

President John McMaster states that it has been clearly proven that the people of America and Canada want and will use Pacific northwest shingles if they are told about their good and lasting qualities. Last year millions of people were told through newspapers, magazines, etc., concerning Washington, Oregon and British Columbia red cedar shingles. Many thousands of bungalow and house plan books were sent out and every day he stated the association received thousands of letters from prospective builders who sought information about the red cedar shingle. This year the scope is to be broadened and anti-shingle legislation is to be contested by newspaper advertising and published facts.

TRADE NOTES

A patriotic folder pointing out the part that each should bear in national affairs, both in his home town and in his own business, is being distributed by the Morgan Sash and Door Company, Department C. 85, Chicago, Ill.

A booklet containing reproductions in colors of various kinds of tiles adapted for floors or wainscoting for bathrooms and other places where it would be advisable to use them is being distributed by the Mosaic Tile Company, Zanesville, Ohio. Reproductions of interiors in which this tile has been used are contained. The booklet will undoubtedly prove of value to the builder who is interested in this subject.

Interesting information concerning simple principles of decoration is contained in a recent issue of *The Dutch Boy Painter*, which is the house organ of the National Lead Company, 111 Broadway, New York City. The issue also contains an article entitled "The Future of the Painting Business," which points out the importance of the selling department. Of interest to the user of red lead is the article "Testing Red Lead Paint by Weight." Of historical interest is a little sketch of Mitchell de Munkazsy in the series "Famous House Painters," which tells something of the life of this man.

At a special meeting of the stockholders of the Penn Metal Company, 201 Devonshire Street, Boston, Mass., George A. Sagendorph was elected president; George Taylor, treasurer and James P. Dolan, secretary. The vice-president elected was Francis M. Johnson, who is located at the company's New York office, 559 West Thirty-sixth Street.

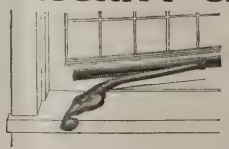
The May 15 issue of *Traffic News*, the house organ of the Federal Motor Truck Company, Detroit, Mich., contains interesting information relative to motor trucks manufactured by this concern. The excellent results reported by various owners of "Federals" are given together with many illustrations showing these trucks in actual service.



Design 105. Complete blue prints of this "Home of Character" for $8.00. Our book "Homes of Character" contains plans for 40 homes designed for particular people. Send 25c and book is yours.

ROBINSON GREENE, Architect
Successor to
JOHN HENRY NEWSON
"Homes of Character"
1026 Williamson Building
Cleveland, Ohio

SECURITY CASEMENT ADJUSTER
For Use On Casements Swinging Out



For both right-hand and left-hand casements. Can be opened as much or as little as desired, so that air can be admitted without also admitting rain or snow. Locks automatically, works easily. Gives a house a very distinctive appearance. Strong, durable, moderate price.

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GEORGE LESTER WILKINS, 7077 N. Clark St., Chicago, Ill.

Containing Plans of This Schoolhouse; Also a Supplemental Plate and Plans

Building Age

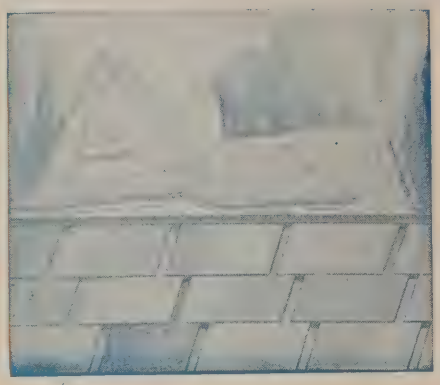
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(Pat. Applied for), Surfaced with Red and Green Crushed Slate in varying proportions creating the desired artistic effect. The Mottled Hudson Asphalt Shingles, on account of their High Quality and Artistic Beauty, were chosen for the roofs of the employees' houses, erected under the auspices of the American Brass Co. and the Scovil Mfg. Co. at Waterbury, Conn., by the W. G. Lynch Realty Co.

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Asphalt Ready Roofing Co., New York.
Send free sample of Mottled Hudson Shingles.

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Address .....

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The Wood-Mosaic Kind

For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips, Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

32 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory, New Albany, Ind.
Sales Office and Parquetry Factory, Rochester, N. Y.

PUT the buildings you build in the Bay Stater's care. Let him paint the brick, concrete and stucco walls with Bay State Brick and Cement Coating. Then they'll last and *last*.

Look at the Michigan Central Depot of Detroit shown here. It's the picture of health and beauty. Bay State Coating made this building waterproof, dustproof and wearproof.

It comes in white and a variety of tints. Send for a free sample and try it. Ask for Booklet No. 19.

Bay State Cement Crack Filler is the first-aid treatment for walls that crack. Let us send you a sample of this, too.

WADSWORTH, HOWLAND & CO., Inc.

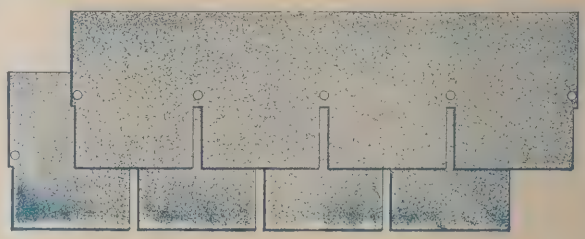
Paint and Varnish Makers

Boston, Mass.
New York Office: Architects' Building

BAY STATE

Warren & Wetmore Architects





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DEALERS who are not stocking asphalt shingles—not getting good business from the line—are overlooking a very important source of profit, because asphalt shingles are enjoying probably a greater sale than any other type of prepared roof covering.

Dealers who carry Rex Strip Shingles are fortunate in having an item which they buy at a consistently uniform price. They are able to protect their profit margins.

The Flintkote line is very interesting. It includes many quickly saleable specialties—all of them thoroughly practical.

We have a proposition to submit. It is just as interesting to the user as to the dealer. Let us send our General Catalog No. 20, which describes and illustrates twenty-three Rex Products. It also gives valuable information about all kinds of roofing materials. It states clearly and completely our sales policy. It will be sent free on request.

Flintkote Manufacturing Co., Inc.

98 Pearl Street, Boston, Mass.

NEW YORK 1104 Equitable Bldg. CHICAGO 851 Peoples Gas Bldg. NEW ORLEANS 701 Hennen Bldg.



The Building Age

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Fresh Air and Protection!



THE IVES WINDOW VENTILATING LOCK

A Safeguard for Ventilating Rooms, allowing windows to be left open at the top, the bottom, or both top and bottom, with entire security against intrusion.

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Prentice Sanger, Architect, New York

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This handsome and homelike country residence has its roof shingles stained with

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to make the house warmer in winter and cooler in summer. The Cabot specialty is the production of unique, artistic and thoroughly reliable house-building materials, and over thirty years' experience has earned them the approval of the leading architects all over the country. You run no risks in using Cabot products.

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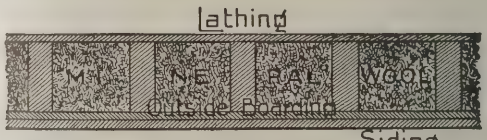
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431 S. Dearborn Street Chicago, Ill.

Eastern Office
Fulton Bldg.
Pittsburgh, Pa.

Southern Office
18 So. 20th St.
Birmingham, Ala.







Section of Outside Wall of House, Showing Wool Between Studding.

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BUILDING AGE

NEW YORK, AUGUST, 1917

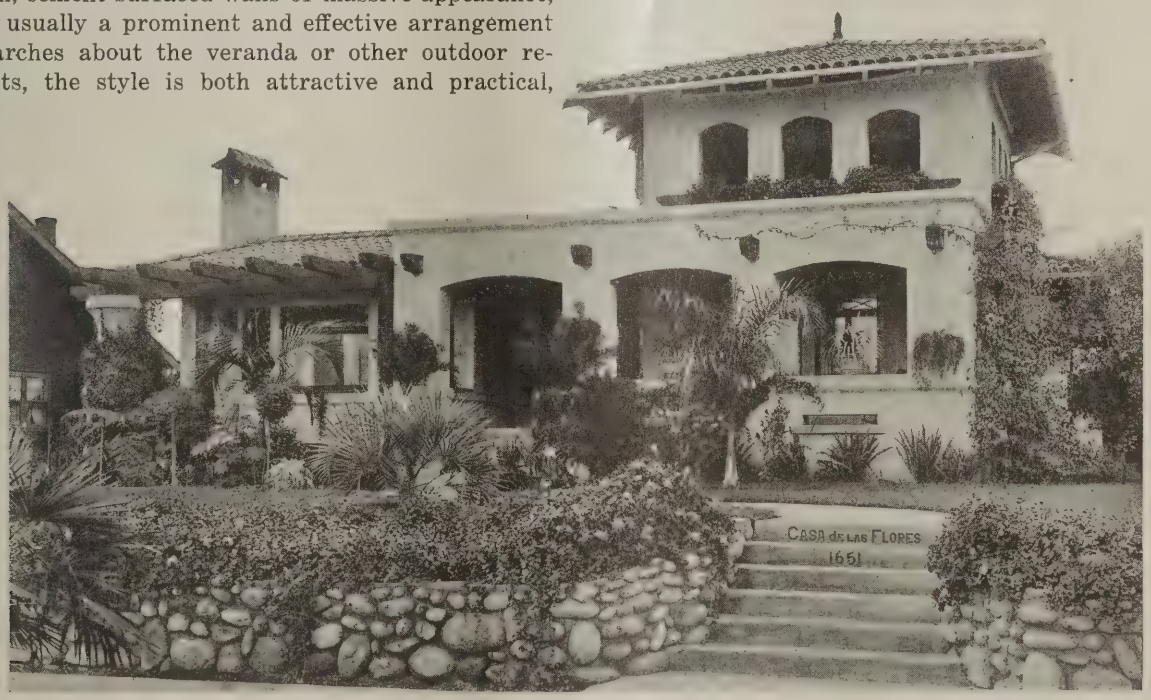
A HOUSE OF CALIFORNIA MISSION STYLE

AN ATTRACTIVE EXAMPLE OF THIS CLASS OF WORK—MANY VALUABLE DETAILS

BY CHARLES ALMA BYERS

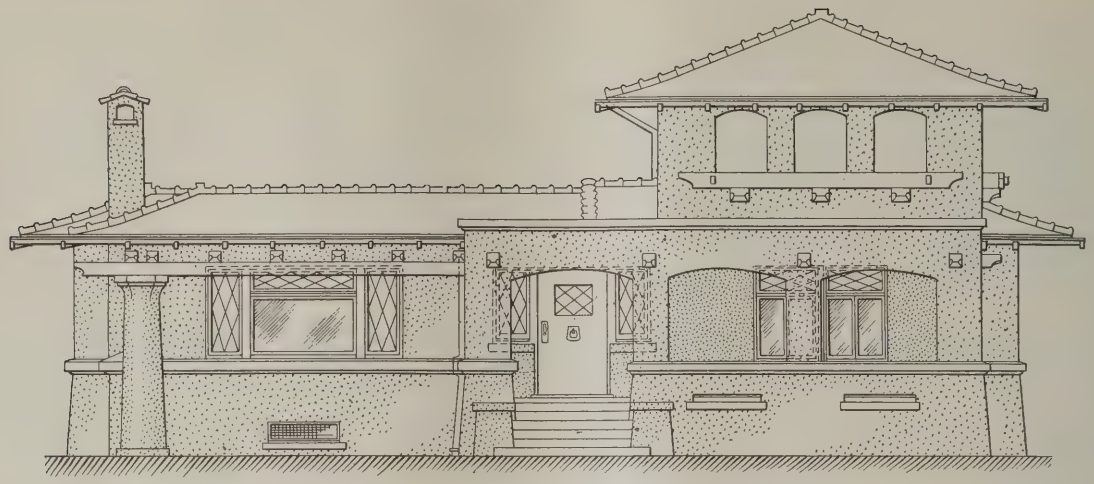
USING as a pattern the early Spanish Missions of California, built under the supervision of the padres during the eighteenth century, there has come into considerable popularity throughout the West and Southwest a style of home architecture commonly referred to as the Mission. Characterized, in a general way, by a red tile roof, rather wide overhangs in the eaves and gables, plain, cement-surfaced walls of massive appearance, and usually a prominent and effective arrangement of arches about the veranda or other outdoor retreats, the style is both attractive and practical, and, moreover, invariably lends itself in admirable fashion to the creation of exceptionally charming garden schemes. Although in recent years it has come to be often modified somewhat by blending with it something of the characteristics of the modern architecture of Spain, or perhaps even occasionally of the Italian villa type, there remains, nevertheless, a real Mission style—a style that, in its correct interpretation, is representative of those architectural monuments left to early Western civilization by the old Mission fathers.

The house here shown has been selected as being an especially conscientious and consistent interpretation of this so-called Mission school. It possesses all the common characteristics of the style, and is comparatively free of evidences of modifying influence exerted by other types. While this particular house is but one story high, save for the tower room, it is not to be inferred, however, that the Mission style is adaptable only to one-story houses. On the contrary, it is quite often excellently represented in full two-story residences, and is likewise employed for homes that range in character and cost from the humble to the most elegant.

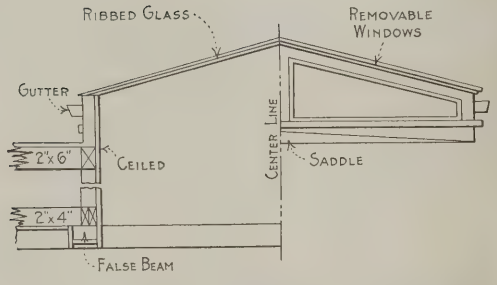


THE FRONT APPROACH TO THE HOUSE—THE STUCCOED WALLS FORM AN EFFECTIVE BACKGROUND TO SET OFF THE BEAUTIFUL FLORA

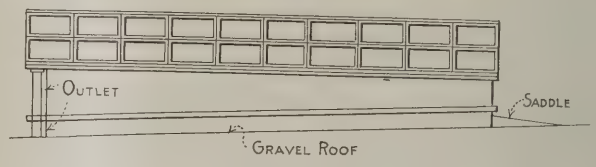
The house has a frontage of 47 ft. 8 in., although it has a width of 5 ft. more through the center, and



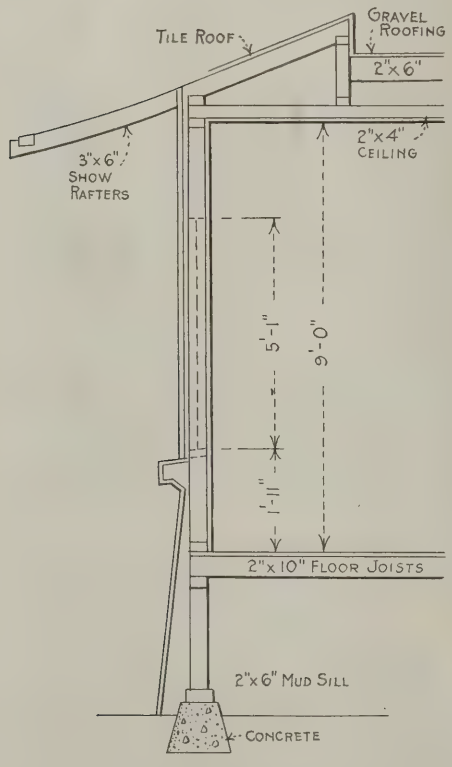
Front Elevation of the House—Scale 3/32 In. to the Foot



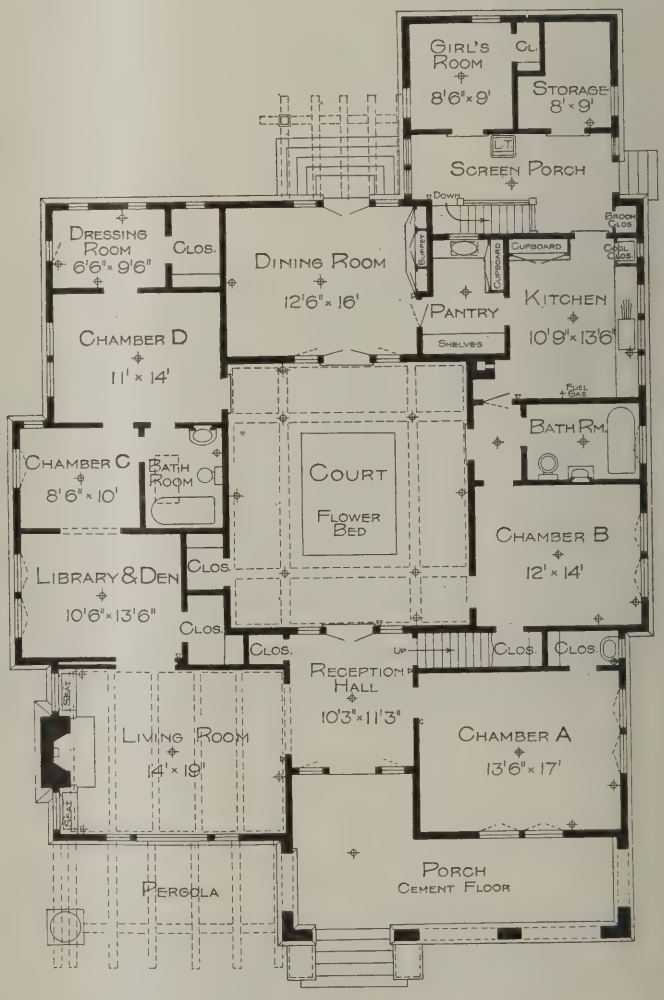
Half Section with Elevation of Skylight Over Court—Scale 3/16 In. to the Foot



Side Elevation of Skylight Over Court—Scale 3/16 In. to the Foot



Detail of Porch Construction—Scale ¼ In. to the Foot



Main Floor Plan—Scale 1/16 In. to the Foot

PLAN, ELEVATION AND VARIOUS DETAILS OF HOUSE OF CALIFORNIA MISSION STYLE

its total depth is 77 ft. 8 in. Reaching entirely across the front is a combination of pergola and cement-floored veranda, 8 ft. 6 in. in depth. Approximately in the center of the front is the entrance, which is recessed off of one end of the porch space to a depth of 5 ft. 6 in. Besides the pergola on the front, there is a smaller one erected over the cement steps of the rear entrance, comprising a fitting link between the house and the back garden. The tower room rises from one of the front corners, and is 18 ft. square in outside-wall dimensions.

True to the Mission style, the exterior walls have a pronounced massive appearance. They are constructed of cement-stucco over metal lath, finished in a deep cream shade, and with a medium rough surface. They are mildly furred at the base, and the water table which caps this furring comprises a belt that encircles the entire house at a uniform elevation even with the bottom of the full-length window frames, which also corresponds with the height of the railing wall of the front veranda. The outward corner support of the front pergola consists of a large round plaster column, of simple design, and the overhead beams of this pergola are somewhat counterbalanced, decoratively speaking, in the upper walls of the front porch by an interesting arrangement of projecting beam-ends. The open spaces of the porch enclosure are of modified Mission arch design, and in each of the four walls of the tower room are three arched openings of the same kind, but smaller. Beneath the group of openings in two of these walls is constructed a long flower box, lined with galvanized iron. The mildly pitched roof, with wide overhangs, is covered with red roofing tile, and the stucco surfaced chimneys are likewise capped with tile roofs. All exterior woodwork is of clear yellow pine, left rustic or unsurfaced, and is stained a soft brown shade, which combines with the cream-colored stucco and the bright red roof to produce a most pleasing and effective color scheme.

The house is built around an entirely enclosed court, 20 ft. 4 in. x 22 ft. 8 in. in dimensions. In the center of this court is a sunken flower bed, approximately 8 x 10 ft. in size, wherein, around a small rustic fountain, is grown a profuse assortment of conservatory flowers and shrubs. The remainder of the floor space is floored with red cement, while the walls are of cement-stucco, like the exterior of the house. Overhead is a center skylight, about 12 x 13 ft. in ceiling area, which is designed with removable windows, and the ceiling space around this skylight is beamed and plastered. The skylight is elevated several inches above the common ceiling height, and hence is provided a sort of bordering fieze, which is hand-decorted in attractive fashion. From each corner formed by the bearing beams around the glassed area is suspended an art-glass lighting fixture, and elsewhere are connections for four other electric lights. The court can be heated in winter almost as cosily as can any of the rooms, and is at all times kept attractively and comfortably furnished.

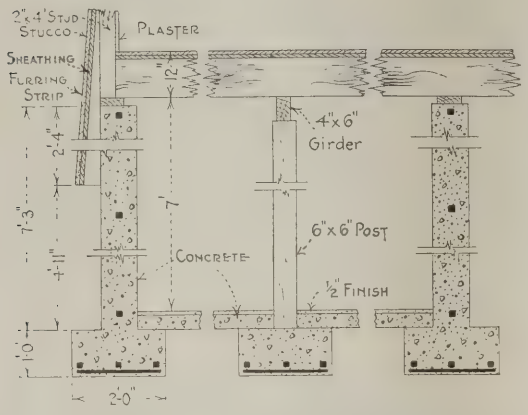


ANOTHER VIEW OF THE EXTERIOR OF THE HOUSE, SHOWING LIVING ROOM END

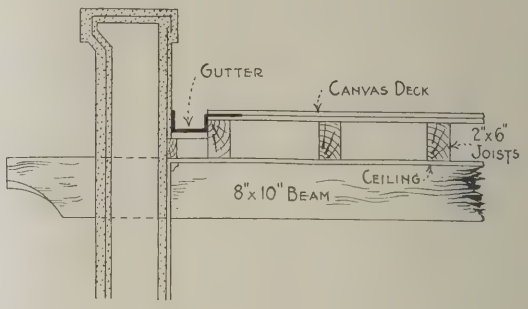
The arrangement of the rooms is clearly indicated on the accompanying floor plan, but in order that it may be fully appreciated some of its points deserve to be specially mentioned. Entering the front door, one finds himself in a small reception hall. Directly before him are French windows through which is obtained a view of the court, with its tiny garden and spouting fountain. But not even with the glimpse into the court does the view end; beyond, directly in line with the front

door, is another pair of French windows leading into the dining room, and beyond the dining room is still another pair opening into the rear pergola and garden. It is, therefore, a most charming vista which one commands as he stands within the threshold of the front entrance.

leading into the living room; back of the latter, with a sliding door intervening, is the library or den, and next in order comes a small bedroom, reached through a portiere-draped opening. The other rooms of this side are a bathroom, another bedroom and a small dressing room. In the other wing, rec-



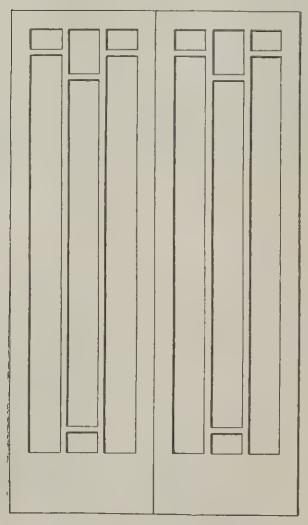
Sections Through Basement Walls Under the Kitchen—Scale ¼ In. to the Foot



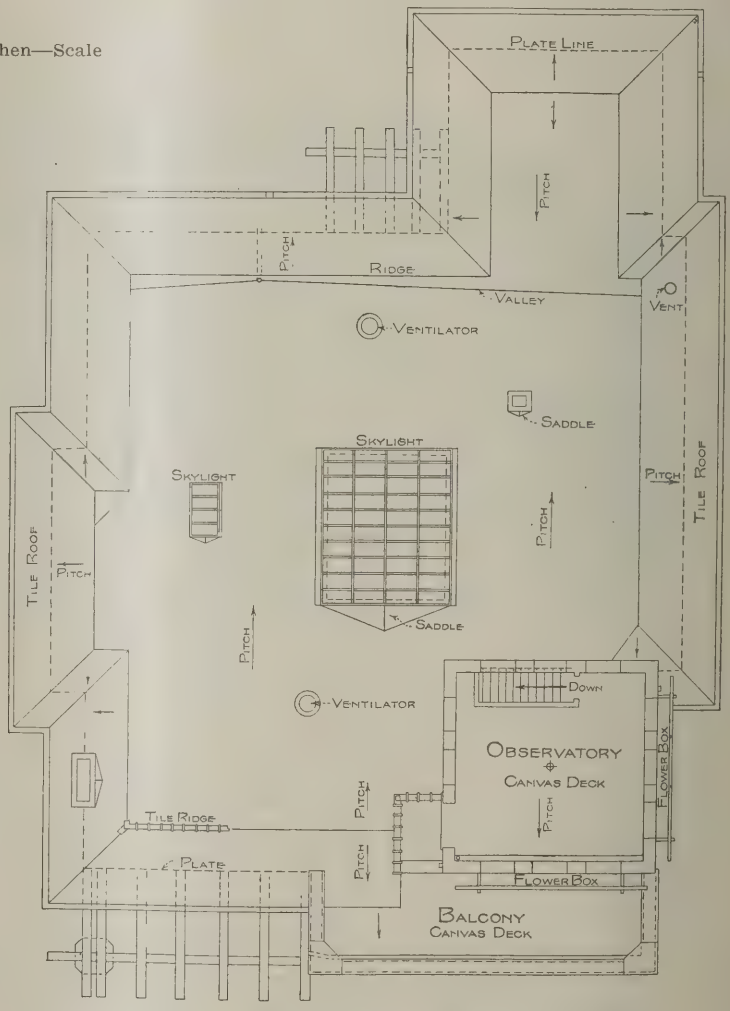
Section of Balcony Over Front Porch—Scale ⅜ In. to the Foot



Section Through Muntin of French Windows — Scale 3 In. to the Foot



Elevation of French Windows Off Court—Scale ⅜ In. to the Foot



Roof Plan Showing Observatory Deck—Scale 1/16 In. to the Front

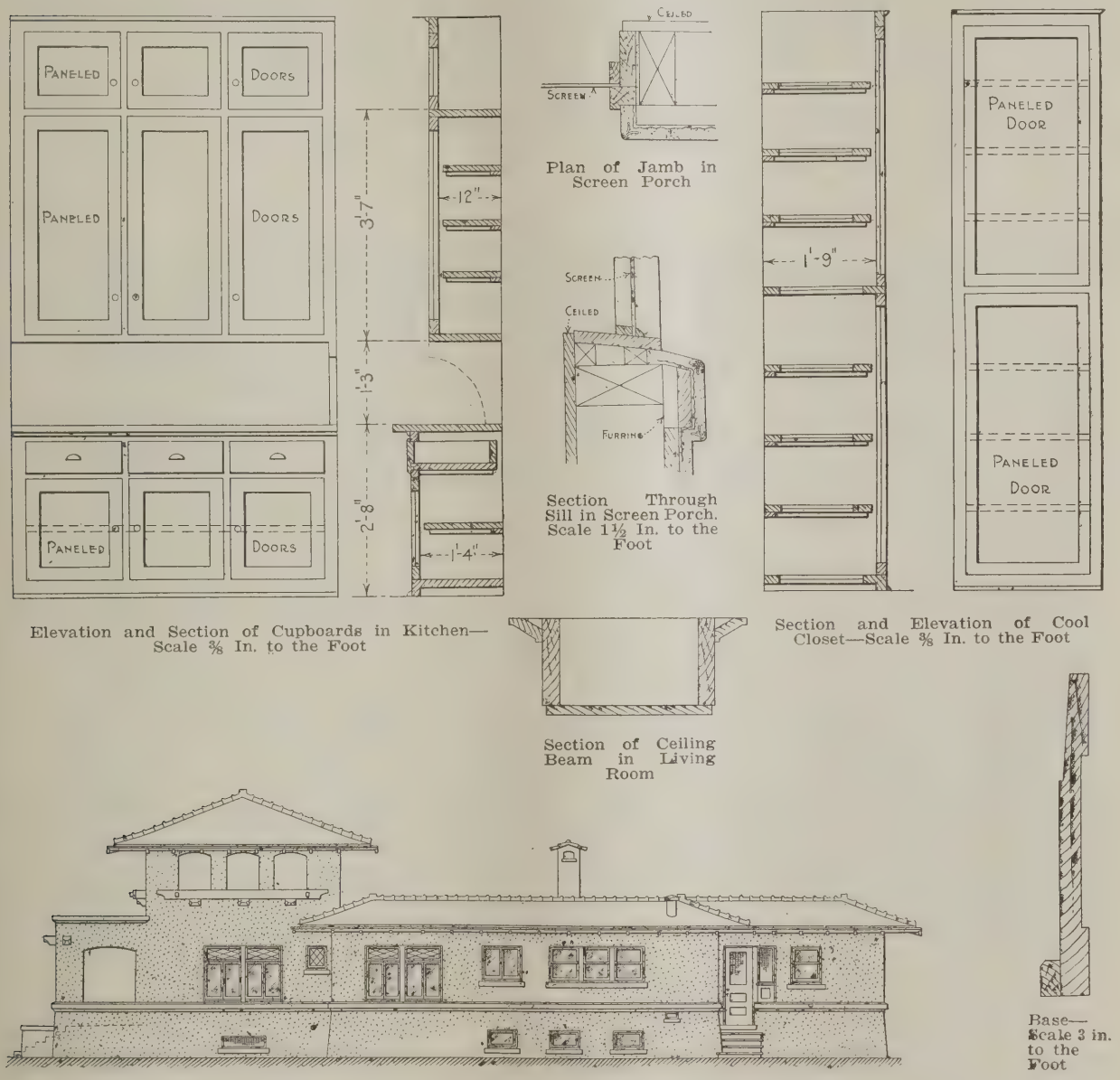
MISCELLANEOUS CONSTRUCTIVE DETAILS OF HOUSE OF CALIFORNIA MISSION STYLE

From one of the rear corners of the reception hall rises the concealed stairway to the tower room, and a feature of the corresponding corner of the hall is a small closet for wraps. To the left of the entry is a broad cased opening, hung with heavy portieres, ognizing the entry hall, the court and the dining room as comprising the dividing line, are, respectively, two bedrooms, a bathroom, the kitchen and pantry, the usual screened porch, the servant's room, and a large storage room. It should be noticed in

this connection that the center court may be reached more or less directly from all parts of the interior.

Particularly desirable built-in conveniences are also a prominent feature of the interior arrangement. The living room, for instance, has a box seat at each side of the fireplace; the dining room has an artistically designed buffet at one side of the kitchen door and a tiny cabinet ledge at the other, as well as a neat little china closet, with a full-length glass door, in each of the remaining corners, besides a gas-grate fireplace with a clock built into its mantel; each of the bathrooms contains a wall medicine case; the kitchen and pantry possess a great deal of cupboard space and a sink each, besides the other customary conveniences, including a long serving shelf in the pantry; on the rear screened porch is a small broom closet, as well as the usual stationary laundry tub; and the library, two of the bedrooms, the small dressing room and the servant's room possess a closet each, while accessible from the court is still another closet. The location of these various features is shown on the floor plan, and herewith are reproduced detail drawings of several of them.

Reached by a stairway descending from the screened porch is the basement, which is approximately 18 x 22 ft. in interior dimensions, and has a ceiling height of 7 ft. Its walls are of solid concrete, 9 in. thick, and its concrete floor is surfaced with a ½ in. finish of cement, while two 6 x 6 in. posts, piercing the flooring and resting on a concrete footing, comprise the center ceiling supports. Besides providing excellent storage room, the basement is also naturally utilized for the furnace, which is of the hot-air kind, which supplies heat to all parts of the main floor, including the court.



Elevation and Section of Cupboards in Kitchen—Scale ⅜ In. to the Foot

Plan of Jamb in Screen Porch

Section Through Sill in Screen Porch. Scale 1½ In. to the Foot

Section and Elevation of Cool Closet—Scale ⅜ In. to the Foot

Section of Ceiling Beam in Living Room

Base—Scale 3 in. to the Foot

Rear Elevation of the House—Scale 1/16 In. to the Foot

ELEVATION AND MISCELLANEOUS DETAILS OF HOUSE OF CALIFORNIA MISSION STYLE

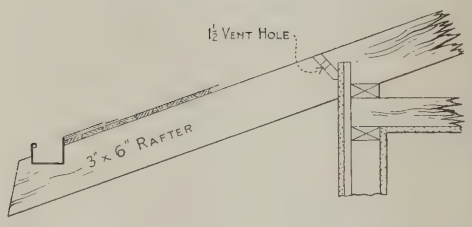
The house rests on a solid concrete foundation, the outside walls of which have a uniform thickness of 9 in. and those of the center court a thickness of 6 in. The outside ones, as well as those of the basement, have a continuous 1 x 2 ft. footing, and are reinforced norizontally with ⅝ in. twisted steel bars, these rods being bent around all corners and lapping at all ends by at least 1 ft. The foundation walls of the court have a continuous footing of 8 x 12 in., but are not reinforced.

All cement floors—that is, of veranda, court and basement—are 4½ in. thick, and have a slope of ¼ in. to 1 ft. The body of the flooring consists of concrete 4 in. thick, which is surfaced with a ½ in. finish coat of cement, marked off into 12 in. squares.

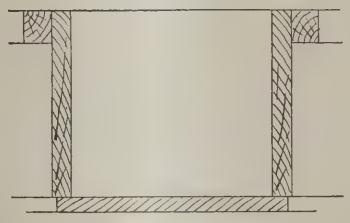
The materials used for the concrete consists of



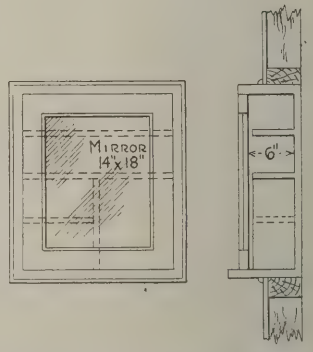
Left Side Elevation of the House—Scale 1/16 In. to the Foot



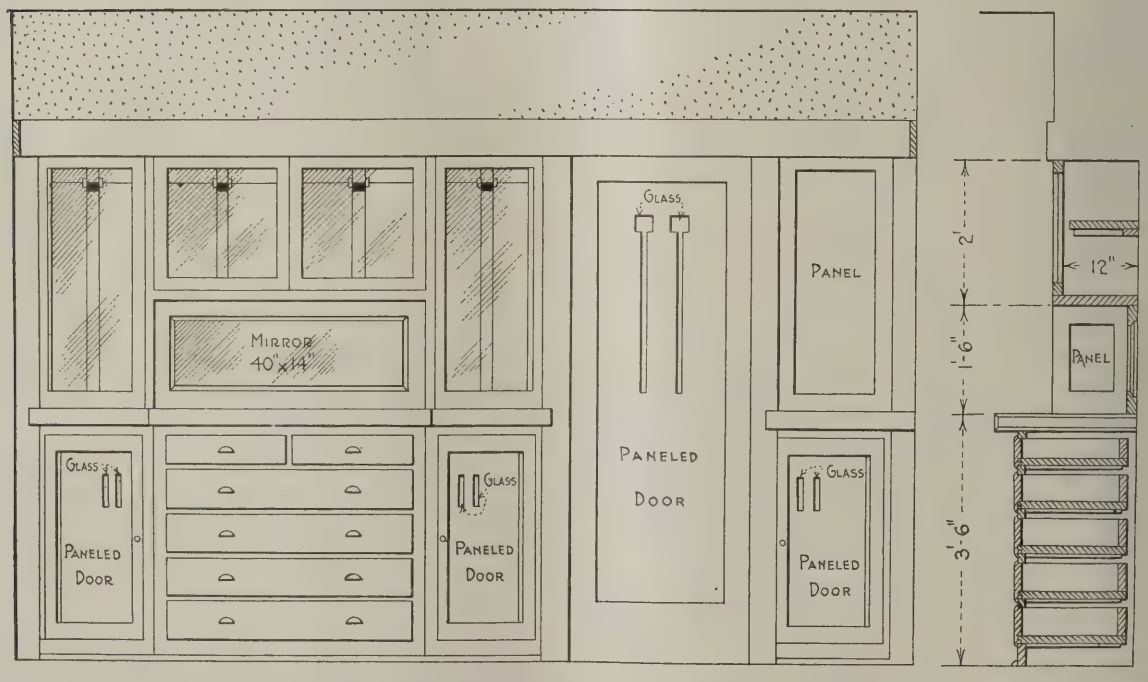
Detail of Main Cornice—Scale ½ In. to the Foot



Section Through Ceiling Beam in the Court—Scale 1½ In. to the Foot



Elevation and Section of Medicine Closet in Bath Room—Scale ½ In. to the Foot



Elevation in Dining Room Looking Toward the Buffet—Scale ⅜ In. to the Foot

ELEVATION AND CONSTRUCTIVE DETAILS OF HOUSE OF CALIFORNIA MISSION STYLE

hard crushed stone, gaged to pass through a 1½ in. ring; clean gravel and clean sharp sand, and Portland cement of standard grade. The mixture comprised four parts of the crushed stone or gravel, two parts of the sand and one part of the Portland cement, thoroughly mixed. It was poured in the trenches or forms in 6 in. layers, and was in the meantime tamped until the water flushed to the top, all being poured in one continuous operation. The cement finish consisted of a mixture of two parts of clean sharp sand to one part cement, brought to a perfectly smooth surface.

The chimneys or flues are constructed of common brick, laid in lime mortar. The inside of these are plastered with cement mortar ½ in. in thickness, and where constructed against the outside or where appearing through the roof they are also plastered on the outside like the house's exterior walls. The one large outside chimney has a clean-out in its base, which is provided with a 6 x 8 in. iron door, swung on an iron frame.

All framing timber is of well-seasoned long-leaf yellow pine, well nailed and strongly braced. All door and window openings are provided with double studs, sides, tops and bottoms, and all studs at corners are likewise doubled, while the openings of greater than 5 ft. expanse are trussed. The mud sills are 2 x 6 in.; sills and girders, 4 x 6 in.; first-floor joists, 3 x 10 in.; and tower room joists of second floor, 2 x 8 in., both spaced 16 in. on centers; ceiling joists and studs, 2 x 4 in., also spaced 16 in. on centers; rafters under tile roof, 2 x 4 in.; show rafters, 3 x 6 in., and roof joists under tar and gravel roof, 2 x 6 in., all spaced 24 in. on centers.

The bridging of the floor joists consists of 1 x 4 in. material, and all studs, midway between the floor and the ceiling, are bridged with 1 x 2 in. material, while the ceiling joists are braced to the roof joists. The ribbons are 1 x 6 in., and are mortised in flush with the studding. Plaster grounds ¾ in. thick are placed around all door and window openings, fireplaces, wainscoting, and so forth. The rafters and joists of the roof are braced to the plates with 1 x 6 in. material, while the show rafters or rafter ends are cut with a curved sweep, as shown by the drawings.

The roof beams of the front porch are of 8 x 10-in. material, and project, with ends sawed as shown, 1 ft. beyond the wall surface. The main beam of both the front and the rear pergola is of the same dimensions, but the cross beams of the front pergola are of 8 x 8 in. material, while those of the rear one are 6 x 6 in. The corner post of the latter is 10 in. square.

The walls of the entire exterior as well as of the court are sheathed solid with 1-in. boards, running diagonally, over which are securely nailed ⅜-in. wood lath spaced 12 in. on centers. In turn, over the wood lath is nailed a heavy-gage approved metal lath. Metal corner heads are used to protect and reinforce the corners of the walls, as well as the corners of all sill courses and other projections.

To the metal lath, as well as directly to the brick of the chimneys, is applied the cement plaster. The



THE FIREPLACE END OF THE LIVING ROOM, SHOWING THE BOX SEATS

primary coat is applied to a thickness of 5/8 in., which is scratched just before dry to furnish a keying surface, and then is used a finish coat 3/8 in. thick, making the cement-stucco full 1 in. in thickness. Each of these coats consists of a wet mixture of two parts sand to one part cement.

The entire tower room and a sort of cornice border with a flat width of 7 ft. are roofed with burnt-clay roofing tile, or red Mission style, made by the Los Angeles Pressed Brick Company. This tiled portion of the roof was first sheathed with No. 2 shiplap, and over this was then placed and securely nailed a layer of 30-lb. tar roofing felt. The valleys are of soldered tin, painted both sides, and the ridges and hips of tile are laid in cement mortar.

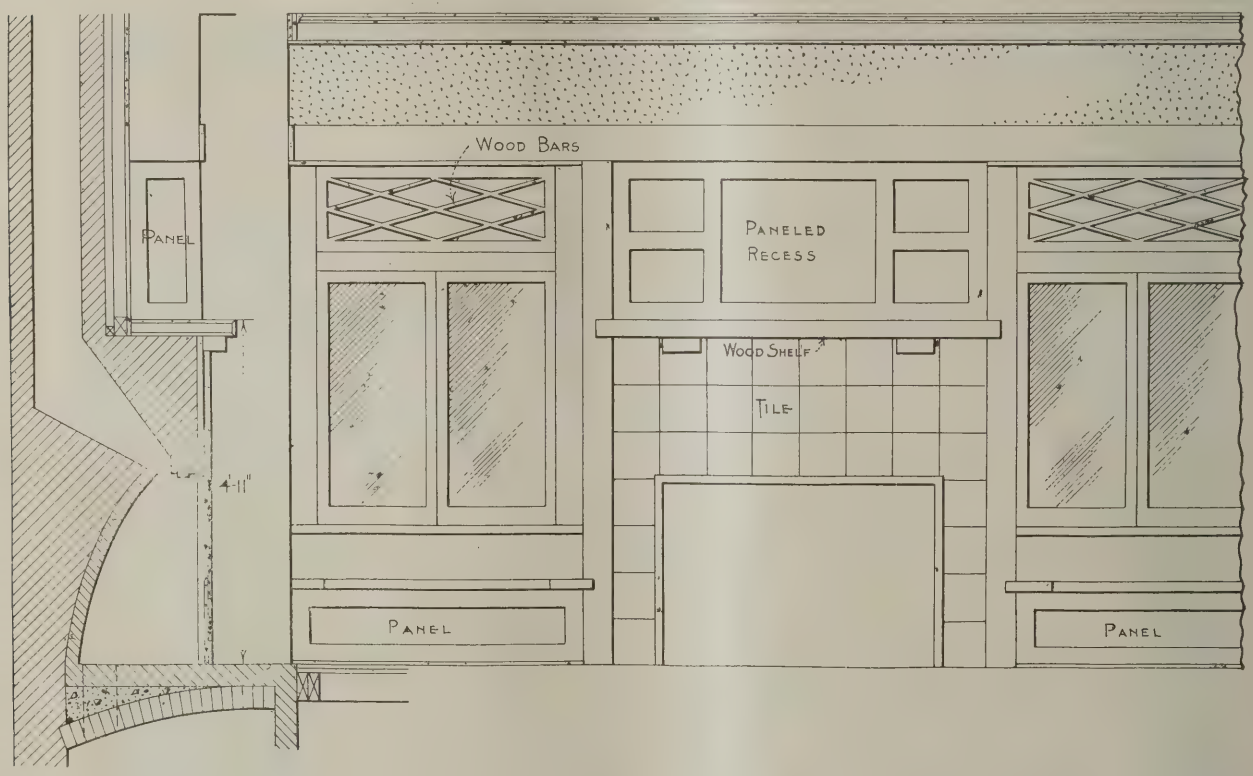
The remainder of the roof, including that of the front porch, is of tar roofing felt and gravel. No. 2 shiplap is used here for the sheathing also. To this was first applied a layer of resin-sized paper, then two thicknesses of tarred felt, followed by a uniform coating of pitch, next two more layers of the tarred felt, and finally another coating of pitch. While the last coating of pitch was yet hot the coating of fine gravel was imbedded therein, approximately 350 lb. of gravel being used to each 100 sq. ft.

Besides the large skylight over the court, there is a smaller one over one of the bathrooms also. The frames of the skylights are constructed of 1 x 1 in. "T" bars riveted together at the intersections. Frosted D. S. glass is used, laid in putty, with the joints covered with a heavy galvanized iron "V" ridge. This ridge is screwed to the "T" bars.

The fireplaces are of simple but very attractive design. The facing and hearth of both are of matt-surface tile, dull green tile being used for the one in the living room and dull brown tile for the gas-grate fireplace in the dining room. The fire backing is constructed of firebrick laid in fireclay, and brass angle frames are placed around the openings. The mantel trimming and shelves are of wood.

For interior finish pine woodwork prevails throughout, except in the library and dining room. In the reception hall and living room slash-grain Oregon pine is used, which is stained a dark weathered-oak color and waxed, leaving the grain of the wood to show. White American quarter-sawed oak comprises the finish in the library and dining room, which is treated with shellac and wax and left in a dull, dark fumed oak shade. In all of the other rooms the pine is enameled white. The ceiling of the living room is beamed, as shown in the plans.

The design of the various windows comprises an especially interesting detail, and in this connection the plans should be carefully noted. Several of them are of the casement type, and some are of the double-hung kind, while the liberal use of small diamond-shaped panes in several of the casements and for the transoms lends a particularly attractive appearance to both the interior and the exterior.



ELEVATION OF LIVING ROOM, LOOKING TOWARD THE OPEN FIRE PLACE, WITH SECTIONAL VIEW OF THE LATTER

The floors of the reception hall, living room, library and dining room are of white quarter-sawed oak of 3/8 x 2 in. material, and all other rooms are floored with 1 x 3 in. edge-grain flooring. All of this flooring, except in the kitchen and bathrooms, was given two coats of shellac, each of which was sandpapered, and was then finished and polished with wax. The floors of the bathrooms and kitchen were treated with two coats of linseed oil and then



THE PATIO OR COURT WITH A VIEW OF THE ENTRANCE HALL AT THE RIGHT

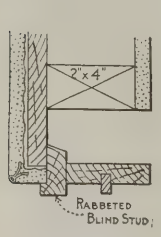


A CORNER OF THE PATIO, LOOKING TOWARD THE DINING ROOM SEEN AT THE RIGHT

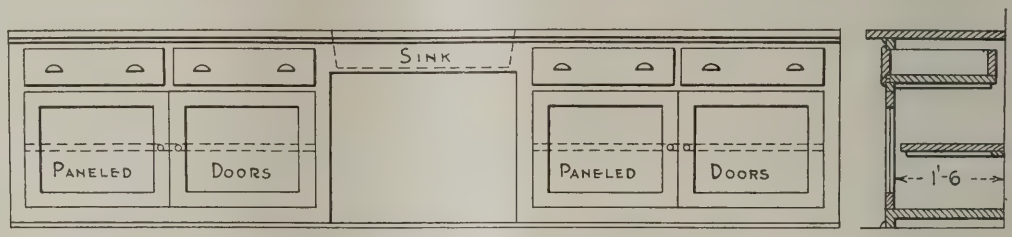
covered with linoleum. The screened porch, the tower room and the deck of the balcony over the front porch are laid with 1 x 4 in. flooring, and over this is a covering of canvas-back roll roofing, with carefully cemented joints. A sub-flooring of 1 in. boards, running diagonally, is used for the entire first floor, except for the screened porch, and between the sub-floor and the finish floor was used a heavy quality of building paper.

All interior walls are lathed and plastered, the plastering consisting of two coats of Acme hard wall plaster, finished with smooth surface, marked openings, but, instead, these openings are provided with roll awnings, which enables the interior to be more or less protected against strong winds and draughts. However, windows, probably of the car type, might have been easily provided for without interfering with the view or with the free circulation of outdoor air. The room is furnished only with a chain-suspended couch and a few camp chairs. From one corner of this tower room access is provided to the balcony over the porch.

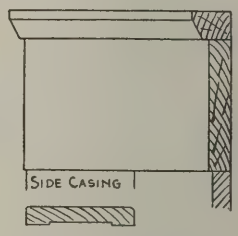
The house is completely and modernly equipped throughout, including gas and electricity connec-



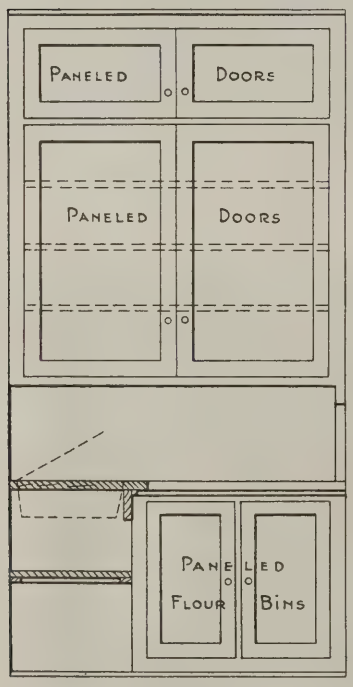
Section Through Frame for Double Hung Windows — Scale 1½ In. to the Foot



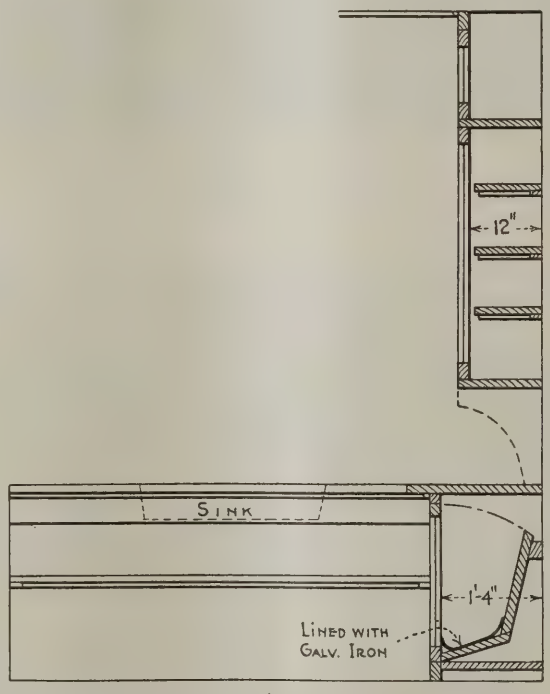
Elevation with Section of Sink in the Kitchen—Scale ⅜ In. to the Foot



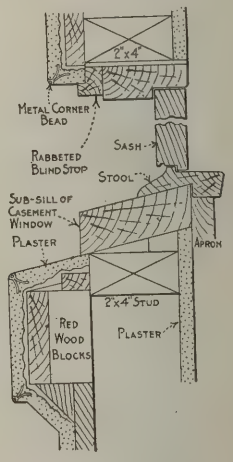
Details of Head and Side Casing—Scale 1½ In. to the Foot



Elevation of Cupboard in Pantry—Scale ⅜ In. to the Foot



Elevation of Sink and Section of the Cupboard in the Pantry



Vertical Section Through Water Table and Casement Window—Scale 1½ In. to the Foot

MISCELLANEOUS CONSTRUCTIVE DETAILS OF HOUSE OF CALIFORNIA MISSION STYLE

off into 6 in. squares and enameled like the woodwork, is used for the walls of the kitchen and bathrooms to a height on line with the top of the window and door frames. The walls of all bedrooms, the dressing room and the servant's room are papered; those of the reception hall, living room, library and dining room are finished with oil-paint and varnish, and elsewhere they are tinted with ordinary flat wall finish.

The tower room, or observatory, as here designed, has no provision for window sash for its arched tions, hot and cold water, all plumbing conveniences, furnace, and so forth. The electric light fixtures are of particularly attractive design, and the bathroom fixtures are neat, modern and complete, even to shower equipment.

Built in Oneonta Park, a suburb of Los Angeles, Cal., the house represents a total expenditure of approximately $6,500, including all equipment. It was designed and built by "Ye Planry," Inc., architects and builders, of Dallas, Tex., and is the home of W. W. Huntington.



FIG. 1—GENERAL APPEARANCE OF ONE OF THE TRUSSES TOGETHER WITH A TOP VIEW

ROOF TRUSS FOR A PUBLIC GARAGE

DESIGNED FOR A SPAN OF 63 FT. 7 IN. —SOME OF THE FRAMING DETAILS

THE ever-increasing popularity of the automobile has necessitated the erection of thousands of garages, both public and private, and the demand still continues in excess of the supply. In the case of the public garage one of the features requiring special provision is the designing of a roof truss which shall be self-supporting and amply adequate for the superimposed roof load. A general view of a truss which meets these requirements is presented in Fig. 1, which represents the elevation of the truss as well as a top view, the truss being shown lying down with its top toward the observer. The picture shows the general arrangement of the framing members and the placing



FIG. 2—A DETAIL OF THE JOINT AT THE FOOT OF THE TRUSS

of the vertical iron rods, as well as the arrangement of the bolts and plates at each end. The view of the top of the truss shows how cast-iron plates form bearing surfaces for the heads of the vertical rods. The joints are rendered exceptionally strong by means of the cast-iron reinforcing plates.



FIG. 3—A DETAIL OF ONE OF THE PANELS

A detail of the foot of the truss is shown in Fig. 2, and clearly indicates the cast-iron plates and the bolts which pass through the framing members. At the left is one of the vertical rods, and the illustration shows how the slanting member of the truss is cut to form a firm bearing for the cast-iron washer over which the nut on the rod is screwed. The framing of the vertical timber at the left is deserving of notice, as it is so cut into the other members as to form a very strong joint.

A general view of the framing of the members at the center of the truss is presented in Fig. 3, which illustrates how the angle beams are framed into the

top and bottom chords of the truss as well as the manner in which they abut each other.

A scale drawing giving the sizes of the various members of the truss is presented in Fig. 4. The member *A-B* covers a span of 63 ft. 7 in., and is composed of four 2 x 12 in. beams bolted together, as shown in Fig. 2, the joints in these horizontal timbers occurring at points where they are not likely to weaken the general construction. The members *A-C* and *D-B* are also composed of four 2 x 12 in. beams spiked together. The top chord *C-D* is likewise composed of four 2 x 12 in. beams breaking joints in convenient places. The other members are 6 x 8 in. Thus, there are only two sizes of timbers employed in the trusses, these being 2 x 12 in. and 6 x 8 in.

In the construction the rod at *K* is 13/16 in. in diameter; that at *E-C* is 1¾ in.; the one at *F-G* is 1 3/16 in., and the rod at *H* is 13/16 in. diameter. The corresponding rods on the other side of the truss are of similar dimensions.

The trusses are supported at their ends by terra cotta piers, which extend out from the wall 10 in., as can be seen from an examination of the walls in Fig. 1. Five trusses spaced 16½ ft. on centers were used to support the roof. Purlins of 2 x 8-in. stuff spaced 2 ft. on centers were notched into the trusses and firmly spiked thereto. The purlins were cross-bridged once between each truss. On the purlins 6 in. boards were placed, and the roof covering was of sheet metal. A skylight was placed between each truss on the left or east side of the building, thus affording plenty of light. Numerous windows were also provided.

The arrangement of the garage is especially convenient for one located on a corner. Entrance is had from the front and the exit is from the rear, so that all danger of cars accidentally colliding is reduced to a minimum. At the left of the entrance there is an office, provided with a large show window, and a sliding door from the garage proper permits an automobile to be placed therein for snow purposes if so desired. At the extreme rear of the building is a workshop, which is boarded to a height of about 4 ft., and above that screened off with heavy wire netting, thus enabling any one in the workroom to see what is going on outside and *vice versa*. The floor is marked off by lines into sections 26 ft. 5 in. long by 7 ft. wide, thus aiding in keeping each automobile in the exact location to which it may be assigned by the manager of the garage. A center space of 10 ft. is left free so that cars may be easily driven through.

The carpentry work of the garage was done by M. E. Sullivan, carpenter and builder, Mount Vernon, N. Y.

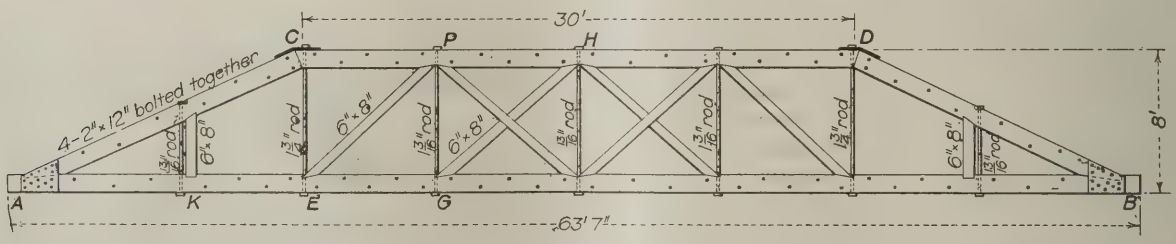


FIG. 4—ELEVATION SHOWING DETAILS OF ONE OF THE ROOF TRUSSES

NEW TENEMENT HOUSE LAW

When what is known as the Lawson bill was signed by Governor Whitman early in June, more than 25,000 private houses in Brooklyn were affected by its provisions. Under the new law these buildings are permitted to be changed into three family tenements at a moderate expenditure for airshaft and minor improvements conforming with the tenement house law as now modified. The average cost of making these alterations is estimated at from $1,000 to $1,200, with an addition of $300 where steam heat is to be introduced.

It is believed that with the large demand prevailing for small apartment accommodations throughout the city, many owners will avail themselves of the opportunity to so alter their houses in spite of the increased cost of material and labor.

It is interesting to note that under the provisions of this bill only houses of brick or stone not over three stories and basement in height and not more than 47 ft. in depth exclusive of bay windows and existing extensions and which were erected prior to April 10 in the year 1901 can be altered into tenements.

The proper ventilation of toilets and the bathrooms presented the most baffling problem in the alteration of these buildings. Under the old law, bathrooms were required to be ventilated either by means of extensions in the rear of the building or by providing an inner court 8 x 14 ft. This would have necessitated in most cases the reconstruction of the entire building. A happy solution for this problem was found in the provision for the ventilation of the toilet and bathroom on the second floor by means of an airshaft of 15 ft. square extending from the ceiling of the bathroom to the roof. The airshaft ventilates but one bathroom and does not communicate with any other rooms or apartments. The other bathrooms must be ventilated as previously required by the tenement house law. The usual plan would be to ventilate the bathroom on the top floor by a skylight and the bathroom on the ground floor directly to the rear yard.

BETTER BUSINESS METHODS IN THE BUILDING INDUSTRY

WHAT A MEMBER OF A PROMINENT EASTERN CONTRACTING COMPANY HAS TO SAY ON THE SUBJECT

IN the last number of the Monthly Letter issued by the Master Builders' Association of Boston, there appears a digest of an address by Leslie H. Allen delivered before that association on the subject indicated by the above title. This matter is of such vital interest to builders and contractors all over the country that we take space to present the following copious extracts:

Something Wrong with the Business

"It cannot be denied that there is something wrong with the building business. Contractors' profits are growing more and more uncertain, and their credit rating, as compared with other business men, is surprisingly low. The wealthy contractor is a rare man, and very few even moderate fortunes are made in the building business.

"In spite of the fact that the personnel of the contractors in the building trade has never been so high as at the present time, we cannot honestly claim that the quality of work we are doing is improving, and it is unfortunately true that our gains are getting smaller.

Building Business Contrasted with Other Lines

"In discussing the subject, it will be worth while to contrast the operations comprehended in the building business with those of other manufacturers, comparing various departments of our work with theirs, with the purpose of determining whether we can learn something that will be of help to us.

"The activities of any manufacturing industry fall naturally into three main divisions—buying, manufacturing, and selling. In addition to this, there are important subsidiary operations of accounting and administration. In our case, we also shall have especially to consider estimating

"First, in relation to selling. If we look at any manufacturing business we find that the selling activities form a very highly organized department of the work. Especially trained men are engaged to act as salesmen. Now, salesmanship in the building business is practically non-existent. For much of our work we wait until someone asks us to figure the job. No effort has been made by us to 'sell' the job, or 'sell' our services in that connection.

Selling Service

"In considering the question of selling from our point of view, it is necessary to emphasize that if builders wish to sell successfully, they must realize that they are not selling buildings, but selling *service*. If we were speculative builders, buying land, erecting buildings, and then selling land *and* buildings, it would be different, but we are approaching the subject from the standpoint of contractors who undertake to work for others on the basis of what others desire. In effect, we offer to assemble men and materials, build the structure, protect the owner against accident or loss, and by the terms of the contract practically guarantee the total cost of the work. All this is service rendered.

The Owner and Bidders

"As the matter now stands, the owner does not recognize our relation as purely that of *'service'* any more than the contractor does. When he, or his architect, calls for bids on a job, he gets a number of figures from contractors of varying degrees of skill and reliability. When the owner considers the bids, he rarely takes into account any differentiation in bidders; he sees simply a list of figures, based on his architect's plans, and thinks that in accepting any one of these contractors he will get just the same building, in the same time, of the same quality of workmanship, and with the same minimum of trouble. He supposes that the difference in cost is a difference due to a difference in profit required by the different contractors. Probably no one has attempted to describe to him the work of the different bidders, and it is natural that his assumption should be as stated.

Points to Be Considered

"If the same owner should be considering buying an automobile, and was left entirely to his own devices, he might, if he knew nothing about cars, assume that all cars are equal in every respect; that he would gain nothing by buying a high-priced car. He is, however, not left long in ignorance by rival salesmen, for very soon he has the good points, and bad points, of cars pointed out to him. If the same amount of intelligence were shown in the selling of contractors' services, we should not hear of so many jobs let at ridiculously low prices, and of so many contractors wasting time in estimating when they know at the start that they cannot bid against the cut prices in competition with the man who intends to scamp the job.

"Now, the building business could be lifted out of the hole it is in if there were more intelligent

salesmanship, in the first place, exercised by contractors who have services worth selling. But before any one can start out on his selling campaign, he must be confident that he has services to offer that are worthy of preference. He should be able to produce recommendations from owners he has worked for in the past, nad should emphasize that there is as much difference between services of contractors as there is between a four-dollar and a six-dollar pair of shoes. It is absurd to let the owner go on buying the cheaper article without trying to interest him in the better article.

Vital Importance of Correct Estimates

"A most important adjunct of selling activities in the contractor's business is estimating. Here we cannot compare ourselves so closely with the methods of other business men, for in no industry, other than, perhaps, the shipbuilding industry, is a more costly or complicated process involved than in the building business.

"When we receive a set of plans and specifications, with the request to submit figures, the owner practically says: 'Here are some pictures, and a description, of the building I want. I don't know how much material will be required, or what conditions you will have to meet, or whether these pictures show completely and clearly the way the building must be built. Anyway, I want you to build a building like these pictures, but if the pictures don't fit together, or the description is not accurate or complete, you have got to build the building right just the same.'

Finding Quantities Required

"We take the pictures, and specifications, and first do our best to find out the quantity of material that will be required. As a rule, all the materials are not definitely described or called for in the specifications, or shown in the pictures, and the contractor from his own knowledge, or judgment, must supply any deficiency. Under the usual conditions, several contractors are doing the same work over and over again, and a small army of subcontractors are figuring their part of the work.

"In some parts of the world the foolishness of this duplication of work has been recognized, and contractors are not called upon either to guess at quantity of material, or to duplicate work of this character, but the quantities are furnished them at the time they are handed the plans and specifications for estimate.

What Is Being Done in Milwaukee

"In at least one city in this country, namely, Milwaukee, contractors have formed a corporation for the purpose of having quantities of material taken off for all of those who are stockholders in the company, a common engineer being engaged for this purpose. The expense of this service is divided among the contractors who have united in this method of dealing with the important question of estimating. As matters now stand with us as contractors, we would be infinitely better off when receiving an invitation to figure if we should send the owner a check for forty dollars, or fifty dollars, and tell him that we could not afford to make a figure.

The Fixing of Prices

"After taking off quantities we come to the fixing of prices. Here we run into still further trouble. In almost all manufacturing industries the cost of the various parts is definitely known from long practice and comparison, and by virtue of the fact that the product is duplicated over and over again under almost precisely similar conditions, so that the question of price may be accurately and readily arrived at. The contractor, however, in estimating, cannot, because of the varying conditions presented, tell with accuracy what price should be made for any particular job of work. The best he can do is to have an efficient system of comparing costs on work that he is doing. This, however, is what he does not do as a rule. It is extremely doubtful if more than a few of the members of this Association have accurate data in regard to the cost of labor on brick work, flooring, windows, plastering, etc., to guide them in making a reasonable guess at the cost of a new job of work. If contractors were willing to put into cost-accounting the money that they could save on estimating under the form above suggested, they would be in much better position to make accurate estimates than they are now, and would not be tempted to cut estimates simply because some other bidder was offering a lower price.

(*To be continued*)

A MODEL OF THE BRONX EXPOSITION

A model of the buildings and grounds of the Bronx International Exposition, which is now in course of construction on the Bronx River, at East 177th Street, has recently been placed on view in the New York, New Haven & Hartford section of the Grand Central Station in Forty-second Street, New York City. The model is said to have cost $3,000, measures 10 x 12 ft. in size, and is constructed to exact scale. It was constructed by the Architectural Modeling Company from plans furnished by the architect, K. M. Murchison. The exposition will open on May 30, 1918.

A short time ago the brick manufacturing companies of the Pacific Coast offered a prize of $500 for the best design for a California bungalow, the competition being conducted by the well-known publication *The Architect.* The decision of the judges shows that the prize was won by George E. Kvall, a draftsman in the employ of Architects Heath & Gove, whose offices are in the National Realty Building, Tacoma, Wash.

SUMMER CAMP IN CALIFORNIA MOUNTAINS

CONSTRUCTION OF CABINS, SANITARY EQUIPMENT AND PLEASURES OFFERED CITIZENS OF LOS ANGELES

THE State of California is proving the big heartedness of its citizens by the manner in which it is utilizing the National Forests in the San Bernardino Mountains for the purpose of providing its residents with the wholesome enjoyment of an outdoor vacation at small expense. The idea first originated in the city of Los Angeles in 1911, and several other cities soon adopted the plan. So successful were the efforts of the originating city, seconded by the United States Department of Agriculture, that a permanent location has been selected in Seeley Canyon, where, for the past two years, citizens of Los Angeles have been afforded two-week vacations at a total cost of $7.50.



Fig. 1—The Bridge Across the Creek

The journey to the camp from Los Angeles is a delightful one, for almost proverbial is the beauty of the scenery which has spread the fame of California. Comfortably seated in a Pacific Electric car, the camper is hurried through an ever-changing vista of rolling hills, rugged mountains, orange groves and vineyards, with now and then a quiet village showing, half hidden by the luxuriant vegetation. All too soon is the first part of the journey ended, for the remainder of the trip must be made by auto stage.

Soon the camp bursts into view. What a wonderful place it is! A gentle stream murmurs its trickling song under a rustic bridge, Fig. 1, and breaks its liquid silver against the worn boulders which obstruct its path, while far up, tier on tier, tower the mighty crests of the giant trees which hide the rugged mountain's flank. The former dotting tents which nestle close down, as shown in Fig. 2, which represents a view of the camp as it stood two years ago, are now replaced by wooden cabins, forty-six in number.



Fig. 2—Camp Before the Cabins Were Erected



Fig. 3—The Cabins Without the Canvas Curtains

INTERESTING FEATURES OF THE SUMMER CAMP IN THE MOUNTAINS

These cabins, erected at a cost of about $65 each, are of two sizes, 12 x 14 feet and 12 x 16 feet, the latter being divided by a partition so as to permit their use by two groups of persons. The roofs are of shingles and the walls are boarded halfway up, as shown in Fig. 3. The space left open between the boarded sides and the roof is covered with canvas, as shown in Fig. 4. Floors are also of wood, and, together with the partitions, are portable, so that they can be removed and stored during the winter.

The layout of the camp is in the form of a horseshoe with a stone and log lodge, 35 x 100 feet in plan, at the curved end. Here is the social center of the camp. Books, magazines and daily papers form an agreeable method of passing the time, or perhaps the more gregarious may choose to gather around the huge fireplace, which is shown under construction in Fig. 5. The "L A" of Los Angeles will be noticed formed in the stone. Telephone service connects the camp with the outside world.

Good, wholesome food is served in an open-air dining room which has a cement floor, 25 x 125 feet in plan. There are no waiters; food is either secured by individual self-serving or by persons doing their hour a day. This hour-a-day idea is one of the features of the camp; each person is required to do at least one hour's work a day, and this explains the low cost of the vacation—there are few labor costs. A kitchen and a storeroom complete the food problem equipment.

Sanitary conditions are adequate. There are two sets of six flush toilets, three sets of eight wash basins, one bathhouse containing two porcelain bathtubs and two showers, one washhouse containing four wash trays, and a water system, including some 3000 linear feet of pipe. Towels, bedding, etc., are furnished by the campers themselves.

A variety of sports are provided. There is a concrete swimming pool, 30 x 65 feet, a view of which is shown in Fig. 6, and an athletic field consisting of a baseball diamond and tennis, croquet, volley ball and handball courts. Disciples of Izaak Walton have plenty of opportunity to search near-by streams.

Boys, girls, men and women go in respective groups and here enjoy a vacation that brings them home happy and healthy. The expenditures to date for this permanent camp total about $8,000, a cost low indeed when compared with the great good that this camp is capable of doing.



Fig. 4—The Cabins with the Canvas Curtains in Place



Fig. 6—The Swimming Pool in Practical Use



Fig. 5—Fireplace and Chimney of the Lodge as It Appeared in Process of Construction

VARIOUS DETAILS OF THE SUMMER CAMP IN THE CALIFORNIA MOUNTAINS

The use of heavy tar paper pasted to the floor by means of paint is said to have been utilized to deaden the noise of trucks passing over a concrete floor in a factory building.

EARLY BUILDING METHODS IN NEW ORLEANS

INTERESTING FACTS REVEALED BY THE REPAIRING OF THE OLD CUSTOM HOUSE IN THAT CITY

BY KING H. PULLEN

WORKMEN delving into the recesses of the foundation and roof of the old custom house at New Orleans uncovered some very interesting and surprising facts concerning the queer but thorough methods of early building operations in the South.

How a massive structure erected on planks and logs in the marshy soil of New Orleans could stand for almost three-quarters of a century without a crack or break of any character, and remains to-day as substantial as when it was built, is proving a marvel to modern engineering experts.

This enormous gray building occupies an entire block. On the site where it rests there stood during the early history of this city some kind of a custom house. It is worthy of note, too, that this block was then situated almost on the bank of the Mississippi River. Ever since then the river has been busily engaged in building up the "batture" with silt taken from other points, and the "batture" has grown in width from year to year until the building to-day stands a full 200 yd. away from the river.

The first custom house was burned in the great fire of 1788, and then Governor Miro erected a better structure. Carondelet, coming on the scene later, swept away everything that was on the site and built Fort St. Locis, covering the entire block.

When, in their turn, the Americans took charge they had no use for forts, so they demolished Fort St. Louis and built a brick courthouse in the middle of the block. A bethel stood alongside.

In 1848 both of these were removed; the site, which had been ceded to the United States, was chosen for the custom house, and the work of building began.

The civil war came on and it was years before the interior of the building was even approximately finished. General Beauregard had technical supervision of the building—he was then



APPEARANCE OF SHEATHING ON ROOF OF OLD CUSTOM HOUSE IN NEW ORLEANS AFTER A SERVICE OF MORE THAN HALF A CENTURY

major of engineers—and it is said that the cornerstone was laid by Henry Clay. In fact, the upper floor had never been completed up to the time of the partial abandonment of the structure a few years ago, when the new postoffice was occupied by government departments at New Orleans.

The foundations prepared for this huge structure will be of interest to the people of to-day, who are accustomed to seeing deep-driven piles made ready for any large building and steel and reinforced concrete used to strengthen every part. The foundations of the custom house rest on a plank floor 7 ft. below the sidewalk, on which is a grillage of 12-in. logs, covered by a layer of concrete 1 ft. deep. Yet the building is there! It has sunk only a foot or two—one end a little further than the other. It has not gone down into the earth as one would have expected of a massive building erected on such a foundation, in the marshy soil of old New Orleans.

A view of the roof now in course of repair offers as many attractive sights to the student of building as the under-structure or the enormous stones used in the walls. Here the carpenter has torn off the copper covering and revealed a great layer of Southern pine sheathing in almost perfect condition. This sheathing was put down under the original roof of the building, and has performed continuous service. Here and there a defect in the roofing has permitted water to seep through and cause a small spot partially rotted. With this exception the sheathing is as good to-day as it was when cut from the Southern pine forests of Louisiana before the civil war.

SCHOOLHOUSE FOR THE RURAL DISTRICTS

TWO CLASS ROOMS WITH SPACE FOR 64 PUPILS—DETAILS OF CONSTRUCTION

WE have taken for the subject of our colored cover design this month a schoolhouse well adapted for erection in the suburban and rural districts of the country. It is intended that it should occupy a plot of ground having a frontage of 75 or 100 ft., with its broad elevation toward the main road, the building to be so placed that the rear portion of the plot can be used as a playground. The schoolhouse has been planned to provide accommodations for sixty-four pupils with two teachers. One class room is to be used for boys and the other for girls. Two additional seats can be placed in each class room alongside the teacher's desk if such a course should prove necessary.

Rooms Separated by Folding Partition

The class rooms are separated by a folding partition, and this is used as a blackboard when closed. When the partition is folded back one large room is formed, which can be utilized when the graduating or other exercises take place. Each class room has its own cloak room.

The class rooms are lighted by means of one row of windows and the seats are placed so that the light shall come in one direction, from the left. The rooms are also ventilated by means of the vents, which are carried up in the chimney.

The Basement

There is a toilet for the boys and one for the girls, and there is also a play room and work shop for each sex. Between the two play rooms is the furnace room with bins or compartment for coal and for wood. The work shops can be used for the weaving of baskets, sewing, etc., and such light instructive work as that now being carried on in some of the larger schools during the summer.

Stairways lead from the basement to the playground in the rear of the building.

The room for the teachers is located on the first floor, and there is also a storage room where supplies, books, etc., may be kept. A stairway from this room leads to the bell tower so that the bell can be taken care of and the flag raised every day that school is in session.

The Plumbing

One line of plumbing is used. The boys' toilet contains two closets, two urinals and one wash basin. The girls' toilet contains two closets and one wash basin.

On the first floor are two drinking fountains placed as indicated on the floor plan.

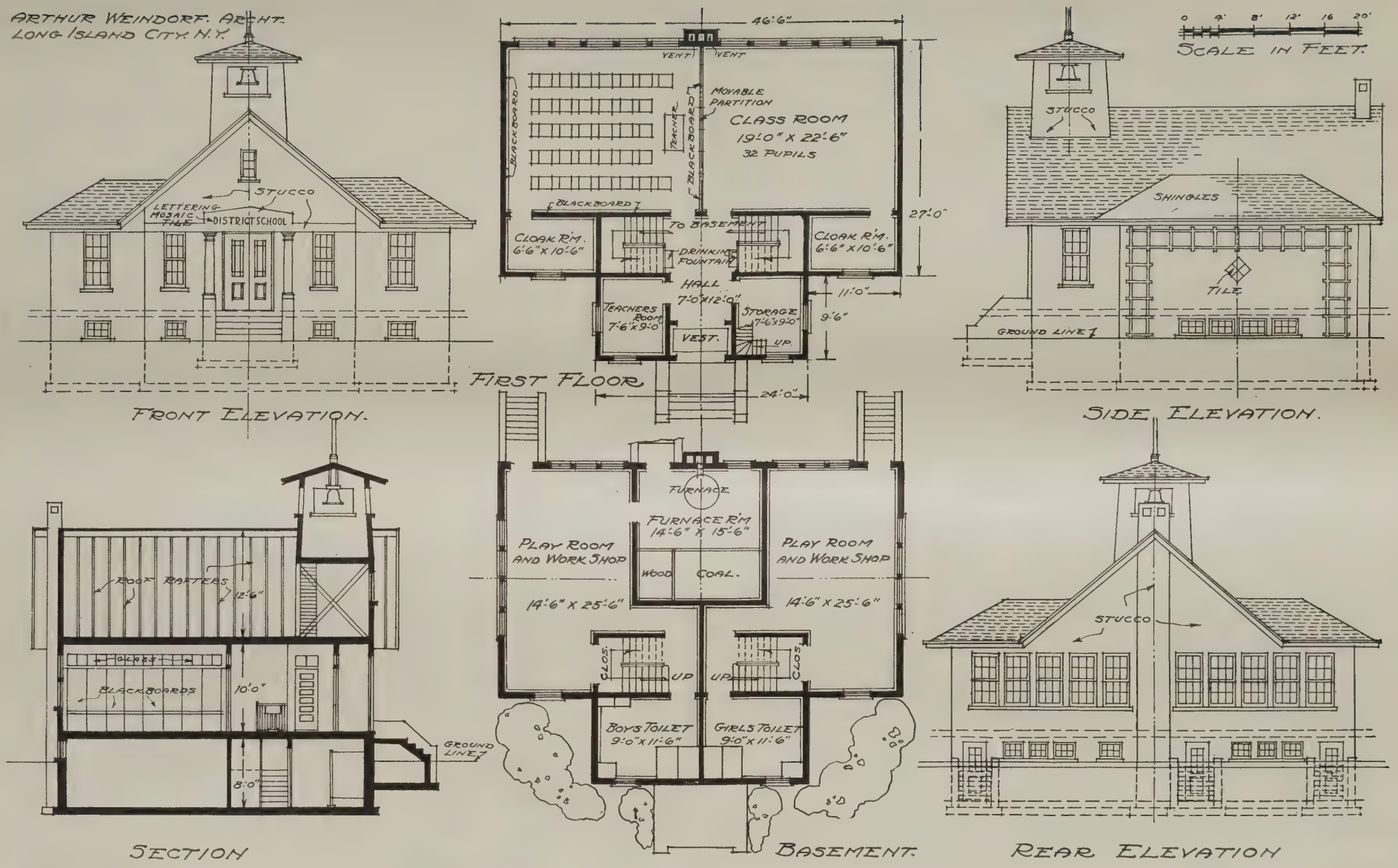
The chimney is arranged to take care of the furnace and the ventilation of the two school rooms.

According to the specifications of the architect, the entire foundations are to be of concrete, the walls being 10 in. thick resting on footings 10 in. thick and 6 in. wider on each side than the foundation walls above. The concrete is mixed in the proportions of one of cement to three of sand and four of broken stone.

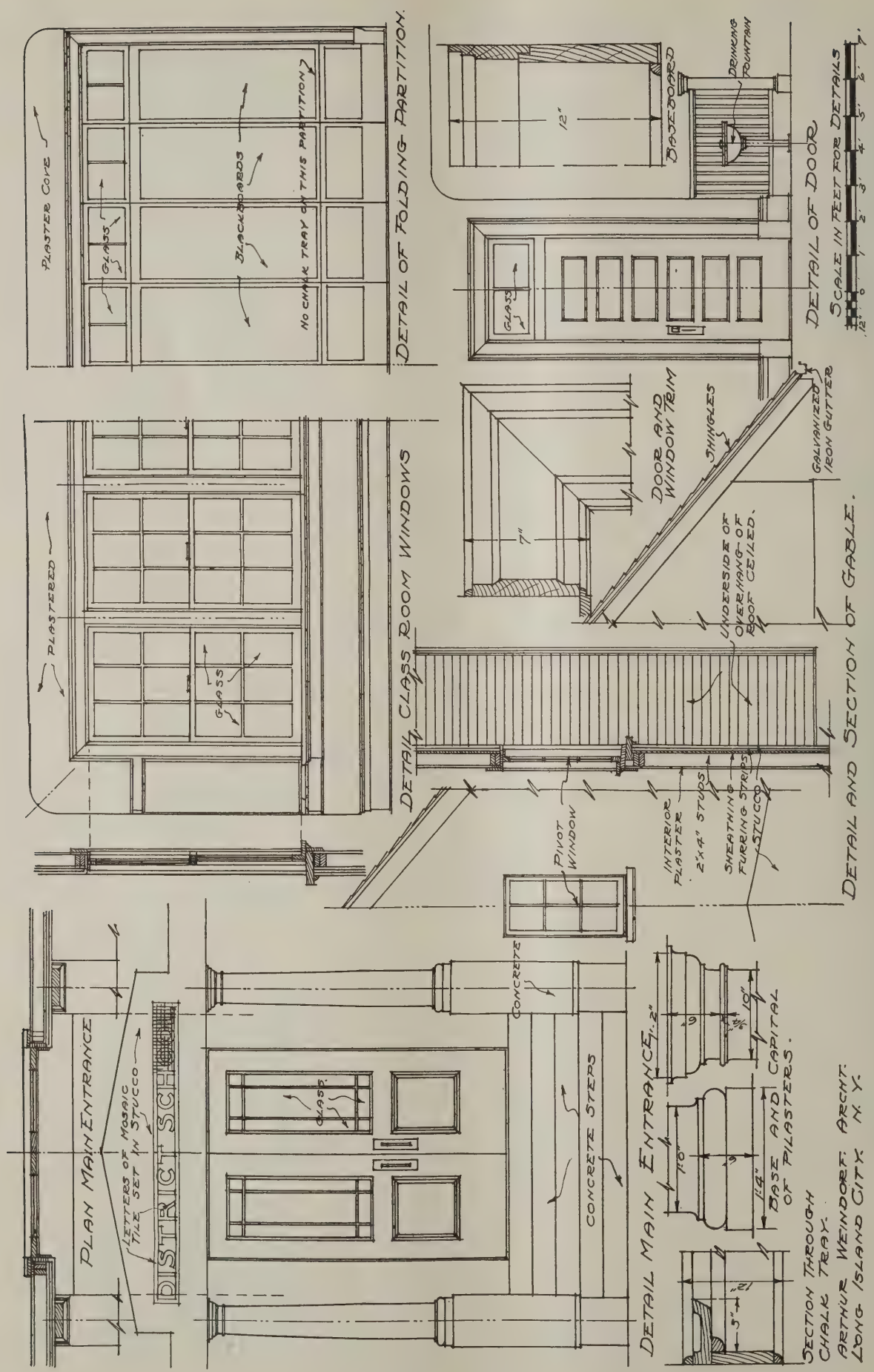
The chimney is built of brick and the flues are lined with vitrified flue lining. The exposed brickwork on the exterior is covered with stucco.

The Framing Timbers

All timbers are of spruce, the sills to be 6 x 8 in., the corner posts 4 x 6 in., the plates 4 x 4 in., and the studs 2 x 4 in., placed 16 in. on centers and braced with one row of 2 x 2-in. cross bridging. The floor beams are to be 2 x 10 in., placed 16 in. on centers and braced with 2 x 2 in. cross bridging spaced about 8 ft. apart. The second tier of beams



PLANS AND ELEVATIONS OF THE DISTRICT SCHOOLHOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE OF THE PAPER



MISCELLANEOUS CONSTRUCTIVE DETAILS OF THE SCHOOLHOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE OF THE PAPER

are to be 2 x 8 in. placed 20 in. on centers and strengthened with cross bridging. The rafters are to be 2 x 6 in. also placed 20 in. on centers.

The exterior walls of the building are to be of 2 x 4 in. studs placed 16 in. on centers, over which sheathing boards are to be nailed diagonally. These in turn are to be covered with 3-ply building paper, upon which are to be nailed 1 x 2 in. furring strips to receive the metal lath to which the stucco is to be applied.

Three-Coat Stucco Work

The stucco is to be put on in three coats, the scratch coat consisting of one part cement, 2½ parts sand and not more than 10 per cent of lime putty, to be applied to a thickness of ⅜ in.

The second or backing coat shall increase the thickness behind the lath to not less than ⅝ in., and the finish coat, consisting of one part cement, two parts white sand and three parts pebbles, is to be applied to a thickness of ⅜ in. The rough surface finish is to be of a light cream tint.

Tiles are to be set in the stucco on the exterior where shown on the elevations. The lettering over the doorway is to be worked out in mosaic tile.

Roof Construction

The rafters are to be 2 x 6 in. placed 20 in. on centers. These are to be covered with roofing boards, over which is to be placed a layer of building paper to receive the cypress or cedar shingles, and which are to be exposed 5½ in. to the weather. The shingles are to be dipped in stain before being laid.

The flooring is to consist of ⅞ x 2½ in. No. 1 North Carolina comb-grain, tongued and grooved, pine, and is to be filled and varnished.

The basement floor is to be of concrete and to have a cement finish. The basement ceiling is to be covered with plaster boards and the joints finished with plaster.

The class rooms, hall, closets and teachers' room, etc., on the first floor are to receive two coats of plaster and all are to have a hard, smooth finish and to be left white. The walls designated on the plan as "blackboards" are to be prepared for this work.

All interior trim and doors of the schoolhouse will be of cypress, and all interior work will be made smooth, varnished and finished natural.

All exterior trim, such as cornice, pilasters, window sash, etc., will be of clear white pine, and all this work is to receive three coats of paint composed of white lead and linseed oil.

The Plumbing Fixtures

The plumbing fixtures are to be enameled iron and of plain design. All exposed pipes are to be given a coat of aluminum paint. The heating is to be by means of hot air, and the apparatus is to be of sufficient size to give a temperature of 70 deg. in the various rooms when it is zero weather outside. All registers are to be constructed in the wall and the register faces are to be finished with aluminum paint.

The hardware throughout is to be of a dull bronze plate finish. All doors, windows and closets are to have the proper hardware in the way of locks, hinges, etc.

The house is to be wired for electricity, with switches located in all the rooms. Indirect lighting fixtures are to be used.

The architect estimates the cubic content of the building to be 36,714 cu. ft., on which he places a unit price of 15 cents per cubic foot. He states that these figures do not include the contractor's 10 per cent profit, neither are the school fixtures included in the estimate.

Owing to the difference in the cost of materials and labor throughout the country at the present time, the cost of the building here shown will vary greatly according to location and style of finish. The unit price per cubic foot is taken as an average of the prices in various localities.

Items of Cost

Some of the more important items of cost as furnished by the architect include $700 for masonry work, this embracing concrete foundations, chimney, cement work, etc.; $725 for plastering both inside and outside; $2,400 for carpentry work, including the lumber, mill work and carpenters' labor; $200 for shingles; $300 for plumbing; $350 for heating; $150 for electric wiring and bell work; $120 for hardware, and $175 for metal work.

The schoolhouse here shown has been designed especially for BUILDING AGE by Arthur Weindorf, 216 Fifth Avenue, Long Island City, N. Y., or care of BUILDING AGE, 243 West Thirty-ninth Street, New York City.

LARGE MOVING PICTURE THEATER

What is said to be the largest moving picture theater on the Pacific Coast is about being erected in the city of San Francisco. The building is to be unique in many ways, and its exterior has been designed something on the principle of a triumphal arch. More than double the number of exits demanded by the building laws have been provided, and the execution of the work will be in multicolored terra cotta.

The theater is to be located on a plot which has a frontage of 275 ft. on Market Street and 550 ft. on Eighth Street. The building will have an entrance lobby 55 ft. wide leading from Market Street to a promenade foyer 50 ft. wide by 250 ft. long. The auditorium will have a seating capacity of 6000 persons on one floor only, there being no balconies. The proscenium arch will be 80 ft. wide.

LAWS LICENSING ARCHITECTS

An act to provide for the licensing of architects and regulate the practice of architecture in the State of Idaho has recently become a law.

A bill was introduced recently in the Pennsylvania Legislature which, if passed, will place that State among those having a law for the regulation of the practice of architecture.

SEWAGE DISPOSAL FOR ISOLATED HOUSES

A DESCRIPTION OF AN ANTI-FREEZING TOILET AND SEPTIC TANK DISPOSAL SYSTEM

BY HARRY GWINNER

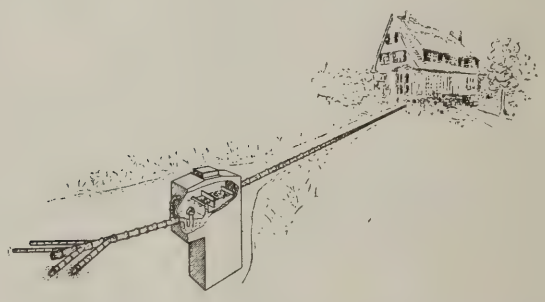
THE purpose of this article is to describe the construction and cost of the preliminary portion of an anti-freezing toilet and septic tank disposal system, which has been in successful operation for more than a year. It gives the cost data covering labor, material and time consumed in the construction. So far as the writer is aware, these important items for such a small system have not received the attention in print they deserve, and as close attention was given the construction of the system, the figures are dependable and will be of assistance to those contemplating the construction of such a small system.

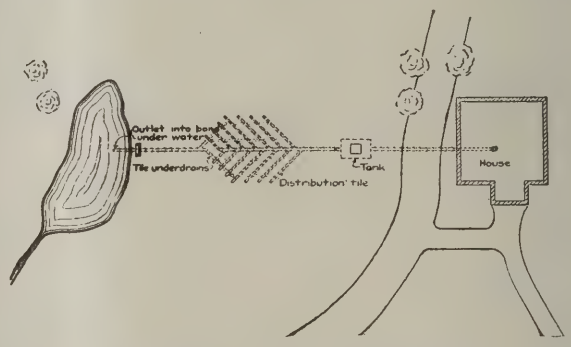
The writer believes the article will be more valuable if certain principles are touched upon, such as the action of septic tanks, automatic siphons and anti-freezing closets, as some reader may desire to know the why of this and that.

The question may be asked why go to the expense of constructing such a system. In reply to this, it is only necessary to state that such a system does away with the unsanitary privy and the pollution of the soil and wells due to the leaching of the liquid wastes which often cause typhoid and kindred diseases. An efficient disposal system renders sewage practically harmless.

Various methods of sewage disposal have been tried in practice with varying degrees of success. The simplest form is that known as the cesspool, this being merely a hole in the ground. The sewage empties into this, the water and a portion of the solid matter held in solution escapes through the sides and bottom into the surrounding soil. On account of the unknown character of the soil in its natural position and the impossibility of predicting the direction of the flow from cesspools the latter are prohibited in some states. Watertight cesspools are quite common, these being made by lining the walls of an earth pit with concrete and emptying them frequently by manual labor. This cleaning is an offensive process and it is difficult to dispose of the contents without danger to health.

However, modern science has developed a system of sewage disposal which is easy of construction, comparatively low in cost and requires attention only at long intervals. The principal agents in this system are bacteria, and by some this system is known as the bacterial system. Bacteria exist everywhere, it being only necessary to provide suitable conditions for them in which to live and multiply. Certain of these thrive only when in filth, in darkness, and kept out of contact with fresh air. They have the power to reduce vegetable and animal solids to liquids and gases. Certain others thrive only when feeding on filth and in contact with fresh air and possess the power to purify the liquid product produced by the former by oxydizing it and reducing it to comparatively pure water and non-injurious gases.





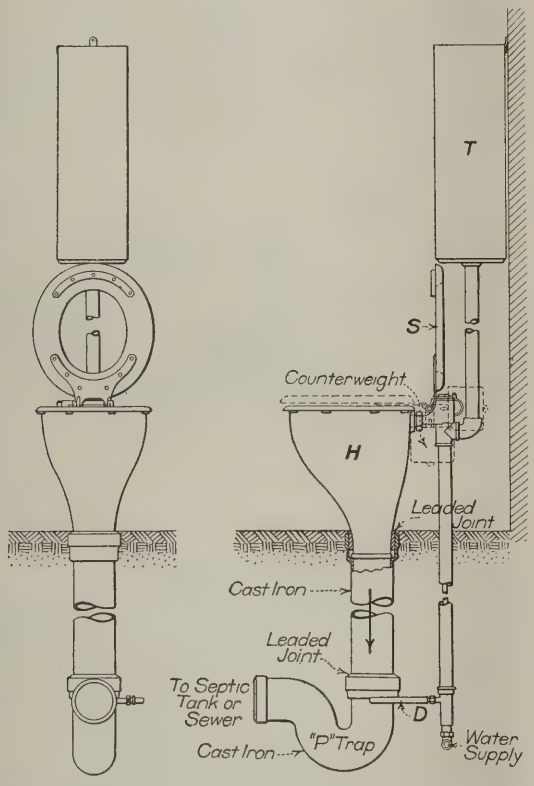
FIGS. 1 AND 2—THE GENERAL SCHEME OF SEWAGE DISPOSAL AS DESCRIBED

Such a permissible sewage-disposal plant should embody the following features, in addition to sanitary toilet and plumbing fixtures: A tight settling and liquefying tank (concrete or other material) into which the sewage first flows and of such proportions that a considerable amount of the solid matter will settle. Joining this tank should be a smaller tight tank (called dosing or discharge tank) into which the liquid sewage will overflow from the settling tank. This second tank should have an automatic siphon arranged so as to discharge intermittently into a disposal field containing a grid or set of tile pipes laid in loosely placed sand or in dry, porous soil.

The writer has in mind such a disposal field in which the network of pipe was placed below the frost line; but the discharge from the siphon was

into manholes and from the manholes into troughs made of cypress. These troughs have openings along the sides at intervals through which but little sewage may escape at any point into the sand bed. The second mentioned set of bacteria living in the sand bed seize upon the sewage as the liquid gradually trickles through the porous bed, depositing the solid matter held in solution until it reaches the pipes which are laid with loose joints. The purified water passes into these pipes, which are properly graded to the final point of distribution. Figs. 1 and 2 illustrate the general scheme.

The solid matter passing with the sewage into the tank first settles to the bottom, dissolves to a certain extent and as a portion of it accumulates it rises and forms a thick scum or "moss" on the surface of the sewage. This is desirable, as it protects the bacteria from the incoming air and is evidence of good bacterial action.



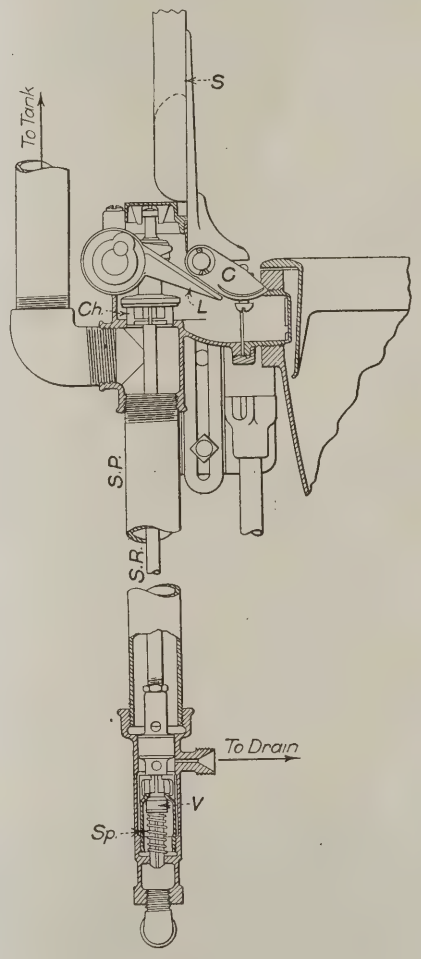


FIG. 3—FRONT AND SIDE VIEWS OF ONE OF THE TOILETS WITH DETAILS OF ITS CONSTRUCTION AND OPERATION

As before mentioned, this system has been in service little more than a year and is giving satisfaction. Over 2000 visitors have inspected this plant and they have been much interested in its simplicity and neat appearance. This system is designed to care for six persons and consists of two anti-freezing hoppers, or toilets, about 260 ft. of six-inch vitrified sewer pipe, and a dark air-tight concrete septic tank. About thirty or forty per cent of the sewage is purified in this tank.

As the toilets are situated in an outhouse having no heat, a description of them will be interesting reading. In Fig. 3 *S* is the seat, *H* is the hopper, *T* is the water storage tank, *C* is the cam which operates the water supply lever *L*, which in turn controls the water supply rod, *D* is the drain pipe, *Sp* is the supply rod spring, and *V* is the water supply valve. The water supply inlet, *P* trap, drain pipe and supply valve *V* are located below the frost line. One of the excellent features of this particular closet is that a small child can pull down the seat *S*. The makers claim for it that five pounds pressure will move the seat against city pressure.

When the seat is depressed, the cam *C* depresses the lever *L*, lowering the valve *V* and check *Ch*, through the *S.R.* Water will then rush up the supply pipe *S.P.* into the tank *T*, but no water goes into the hopper *H*, due to the check having closed the inlet to the hopper. As soon as the pressure on the seat is relieved, the counterweight causes it to assume a vertical position, the valve *V* returns to its normal position due to the spring *Sp*, thus closing off the water supply. The water then rushes from the tank into the hopper, flushing it. The water in the supply pipe which does not go into the hopper passes from this pipe through the drain *D* into the *P* trap. In this way no water remains to be frozen.

The excreta or sewage, after leaving the toilets, is conveyed through the 6-in. pipe to the septic tank. This pipe was laid in a carefully graded

ditch, and owing to the lay of the land two grades were necessary, 80 ft. being on a 10 per cent grade and 120 ft. being laid on a 4½ per cent grade.

As an experiment, a departure was made from the general practice relative to the pipe. The standard practice appears to be to use 4-in. pipe and the joints, or bells, cemented with a mixture of one part of cement to one part of sand. In this system none of the joints was cemented as the earth through which the pipe ditch passes is a firm clay and great care was taken in placing the pipe and thoroughly tamping the clay around it. Six-in. pipe was used to minimize the danger from clogging.

(*To be continued*)

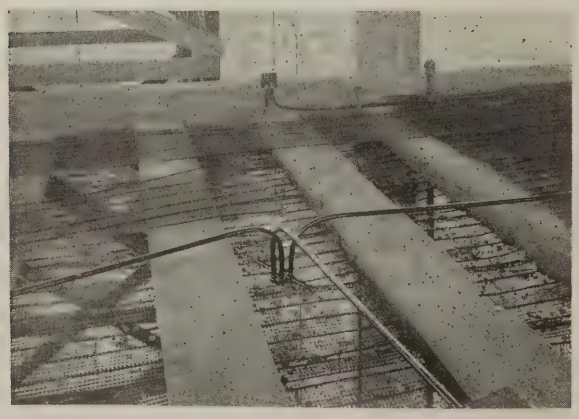
NEW TYPE OF FIREPROOF CONSTRUCTION

NOVEL FEATURES INVOLVING THE USE OF METAL LATH IN COMBINATION WITH CONCRETE

BY ZENAS W. CARTER

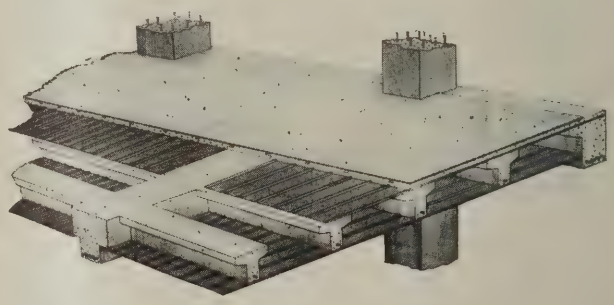
THE twelve-story model fireproof reinforced concrete building which is to house the Federal Trade Commission at Washington and rapidly nearing completion at the corner of K and Fifteenth Streets, is the first ever constructed by the new method here described. The originator of the plan, Hewitt Wells, is entitled to considerable credit for his ingenuity and the unusual way in which he has used in this building metal lath, reinforcing bars, and cement, and at such a great saving in cost of both material and labor. The very simplicity of the idea accounts for the speed with which this building is being erected, practically one story being "poured" every five working days.

After the wooden supporting framework has been built up similar to that used in all reinforced concrete construction, all of the metal lath for the ceiling is laid directly on the wood forms, this being tied together in the usual manner. On top of this and correctly spaced, the steel reinforcing bars for the beams have been properly placed, centering 28 in. and set up the required height above the metal lath to thoroughly imbed them in the concrete beam when it is poured.

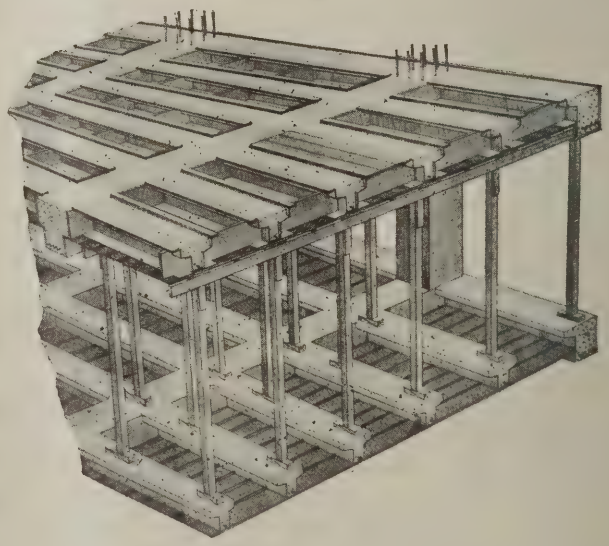


Metal Lath Imbedded in Base of Concrete T-Beams Ready for Plastering

The workmen then place on top of the lath and in their correct position special type steel forms made as a cubist might write a figure 5 and its inverted counterpart. These forms are properly spaced with wood spacing wedges, so that the resulting reinforced concrete beam will span exactly 28 in. on centers. When poured the concrete forms a T-beam, the base of the "T" resting on the board support previously erected and automatically filling in around the metal lath and reinforcing rod in such a manner that the metal lath is imbedded in the base of the T-beam and is ready for plastering just as soon as the beams have set sufficiently to permit the removal of the supporting bracing and framework.



Showing Portion of a Floor Completed



View Showing the General Scheme of Concrete Construction

The steel forms are then removed *upward*, obvi-

ating the necessity for delaying the work until the beams have set enough to support themselves and the workmen above. Then, after all piping, wiring, electric outlet boxes, etc., are put into place, another set of sheets of metal lath are laid and tied in place immediately on top of the T-beams, covering the piping, electrical work, etc., and a 3-in. cinder concrete floor is poured on top of this, the metal lath giving the proper amount of steel reinforcing to support the floor across the span and at the same time acting as a base to hold the cinder concrete in place.

The great saving in dead weight effected by this method of construction comes through the elimination of the surplus weight between beams and the saving which the designer claims is made in addition to the elimination of the 25 to 30 per cent in floor dead weight is due to the fact that no useless forms need be left in the structure, and the steel forms used are removed upward instead of downward, thus greatly facilitating the speed of the work.

With the present high cost of reinforcing steel, this new method of using metal lath and practically duplicating wood joist construction by reinforced concrete beams, and the consequent reduction in cost, insures this type of construction becoming popular with architects and engineers. Another especially interesting point about this building is the fact that the roof is concrete, poured over metal lath stretched over concrete beams, and the ceiling under the roof is a metal lath suspended type.

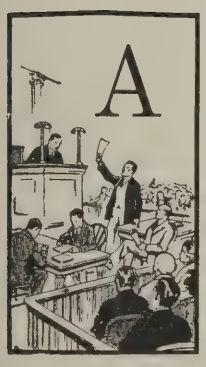
The architect and contractors state that the Building Commissioner of Washington, Morris Hacker, had no hesitation in approving this method, even for this twelve-story building which is now the highest reinforced concrete building in Washington or vicinity, as the lighter load on each floor obtained through the use of this method certainly justifies the lighter weight reinforcing structure throughout.

The architect of the building is B. Stanley Simmons and the contractors M. A. Weller Co., both of Washington, D. C. It is of interest to note that the originator of the new form of construction is connected with the T-Beam Engineering Co., also of Washington, D. C.

LEGAL ASPECTS OF BUILDING OPERATIONS

ARCHITECT'S LICENSES AND COMPENSATION—IMPORTANT CONTRACT OBLIGATIONS INTERPRETED

BY A. L. H. STREET



A DECISION that promises to take prominent place in the law of building trade boycotts was lately handed down by the Minnesota Supreme Court in the case of George J. Grant Construction Company vs. St. Paul Building Trades Council. The principal point decided in the case is that it is not unlawful for the members of building trades unions to agree among themselves that they will not work for a contractor with whom they have a controversy nor for any subcontractor under him.

Plaintiff sought an injunction against defendants to restrain them from interfering with plaintiff's work by inducing teamsters and workmen to refuse to haul or work upon any of plaintiff's materials, etc. The trial judge denied an injunction and the Supreme Court has affirmed the judgment on appeal, saying that employees have the same right, severally or collectively, to refuse to work in an "open shop" that employers have to maintain such shop.

The higher court, in support of its conclusions, cites pertinent decisions in other and similar cases: An Arkansas decision holding that members of a labor union could validly agree not to lay stone for the foundation of a building should an employer of non-union labor secure the contract for the superstructure. A holding of the New York Court of Appeals that unionists might lawfully threaten a general strike of all men of other trades employed on plaintiff's building. A decision of the United States Circuit Court of Appeals sustaining the validity of an agreement between mason contractors and bricklayers under which the latter refused to work in case of subletting of fireproofing contracts. An opinion of a New Jersey court that union carpenters might refuse to handle the products of an "unfair" manufacturer. A holding of the Rhode Island Supreme Court that an association of master plumbers were within their legal rights in refusing to buy goods from wholesale dealers selling to non-members of the association.

Another decision of the Minnesota Supreme Court lately announced upholds the validity of a verbal agreement whereby a firm of architects was employed to prepare working plans and specifications for a building, obtain bids for its construction, and superintend erection of the structure, although it was contemplated that a written contract would be subsequently entered into, and it was never executed. Lamoreaux vs. Weisman. This holding rests on the fact that all the essential

terms of the contract were orally agreed upon and that the proposed written agreement was intended as a mere record of the understanding already had.

Illinois Architectural Law

Interpreting the provisions of the Illinois statutes which forbid licensing of stock companies to practice architecture, but permitting them to employ licensed architects, the Supreme Court of the State holds that a corporation may validly contract for the performance of architectural work to be performed by a licensed person or under his supervision. It is declared by the court that the purpose of the law, as shown by its requirement that licensees possess knowledge of the strength of materials, laws of building, sanitation, etc., was not merely to protect architects by limiting work to those holding licenses, but to protect the public against incompetent architects.

In the case of Phelps vs. Vaky, the Texas Court of Civil Appeals has affirmed judgment in favor of plaintiff covering services rendered as an architect in preparing plans and specifications for a building. Among other points decided in the case, it is held that, under employment to prepare plans for a structure at an estimated cost of $70,000, an architect is entitled to recover compensation for furnishing plans accepted by the owner although it develops that the cost of construction will be $75,000, this variance not being so great as to show substantial failure to keep the building within the cost limit fixed. It was further held that the owner was not entitled to a deduction to cover the cost of changing the plans to conform to a request made by him after he had accepted and approved the plans as originally submitted.

Identity of Employer

A contracting firm undertook to superintend the clearing of a building site at Grand Rapids and the erection of a new structure, and to "co-operate" with the owner "in purchasing material and in employing men and teams." The contractors actually employed the workmen and posted notice of conformity to the Michigan Workmen's Compensation Act, but the provisions of the contract plainly indicated that control of the work was vested in the owner and that in employing men the contractors were mere agents for the owner. The work had just been commenced when an old wall fell, killing and injuring several workmen. The State Industrial Accident Board made awards against the contractors on the theory that they were the employers, but the Supreme Court of the State has reversed the allowances, holding that the owner was the true employer. (Opitz vs. Hoertz.)

An ordinance of the city of Norfolk, Va., purporting to require general contractors to pay distinct license taxes for the privileges of doing brick masonry, plastering, roofing and sheet metal work, cement and concrete work, painting and decorating, and stone masonry, all in addition to a tax for the privilege of doing carpenter work, has been declared to be invalid by the Virginia Supreme Court of Appeals, as contravening a policy evidenced by the statutes of the State to treat general construction work as a single taxable pursuit under the license laws of the State. (City of Norfolk vs. Griffin Brothers.)

Giving effect to a provision in a building contract, to the effect that the builder should be entitled to an extension of time in which to complete the structure equal to any delay "by the acts of the owners or by the acts of God, which the contractor could not reasonably have foreseen and provided for, or by stormy weather which prevents the work," on condition that "a written demand for additional time with the amount thereof approximately stated and the reasons for such demand given is presented to the owners by the contractor within twenty-four hours after the cause for such delay has accrued," the California District Court of Appeals has refused to allow the builder credit for delay caused by extras ordered by the owner, rains and mistakes of the owner's architect, where written demand for an extension of time was not presented. (Suhr vs. Metcalfe.)

Substantial Performance of Contract

Where a contractor has failed to construct a building according to plans and specifications, but the defects can be remedied readily, the owner is limited to a claim for the reasonable cost of making the necessary corrections in the work, according to a general rule of damages reaffirmed the other day by the Connecticut Supreme Court of Errors, in the case of M. J. Daly & Sons vs. New Haven Hotel Company. The same opinion is authority for saying that where the builder has substantially performed his agreement he is entitled to enforce a mechanic's lien to secure payment of his compensation, notwithstanding minor defects in the work, subject to an allowance to the owner of a deduction from the contract price sufficient to cover the cost of corrections.

The importance, from the building contractor's standpoint, of an express understanding with an owner as to the time or times when payment is to be made while agreed work is in progress, is suggested by the late holding of the New York Court of Appeals:

> "Where a contract is made to perform work and no agreement is made as to payment, the work must be substantially performed before payment can be demanded." (Stewart vs. Newbury.)

In this case, the court refused to consider testimony tending to show a custom of making monthly payments to builders covering work done to the extent of 85 per cent of the value thereof, the owner retaining the remaining 15 per cent until completion of the work.

Kew Gardens, Long Island, N. Y., is soon to have its first apartment house. It will be a four-story structure with a facade, an attractive adaptation of the Italian style. The color scheme will be a creamy gray trimmed with green, in restful harmony with the rural surroundings. The plans have been drawn by Andrew J. Thomas.



THE HINCHCLIFFE BUNGALOW COURT AS VIEWED FROM THE MAIN ENTRANCE AND SHOWING THE DISPOSITION OF THE TEN BUILDINGS OF WHICH THE COURT CONSISTS

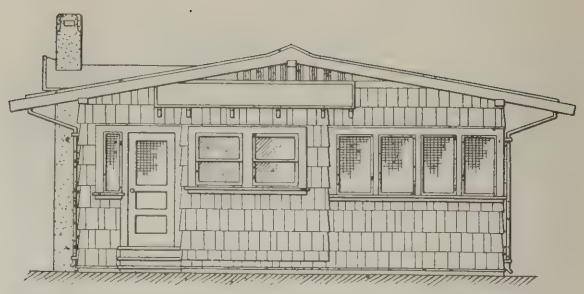
A BUNGALOW COURT IN TUCSON, ARIZONA

NOVEL SCHEME FOR ACCOMMODATING VISITORS DURING THE SEASON FROM OCTOBER TO MAY

IT is a well-known fact that vast numbers of tourists go from the Northern climate to that of the Sunny South during the winter months of the year, and the influx in Arizona is such that some of its cities are obliged to provide special accommodations in order to comfortably house all visitors who desire to remain for a time within their limits. An ingenious and effective scheme of housing the winter visitors in Tucson, Arizona, has been worked out by providing a bungalow court, some views of which are presented herewith. The housing problem has become an acutely serious one in the city named on account of the great numbers of visitors from the colder sections of the country to get the benefit of the climate of Arizona. There was a general lack of accommodations all around as the



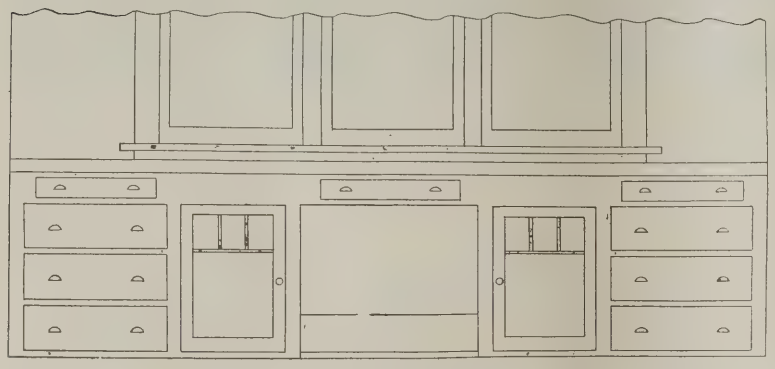
FRONT VIEW OF THE BUNGALOW SHOWN AT THE LEFT OF THE MAIN ENTRANCE



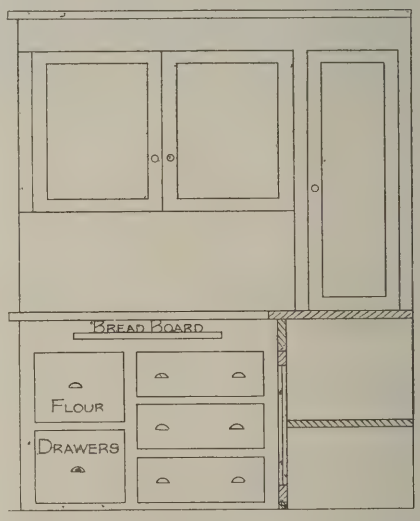
Rear Elevation—Scale 3/32 In. to the Foot



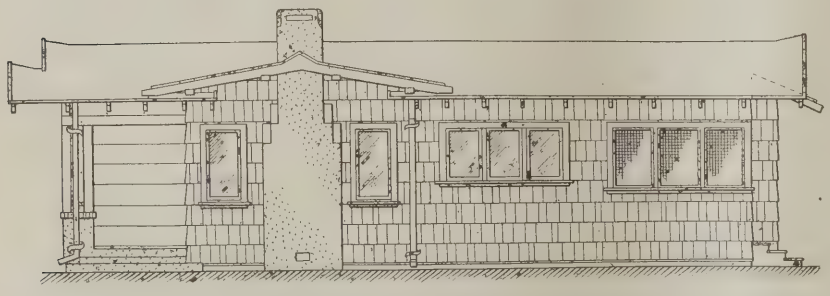
Front Elevation—Scale 3/32 In. to the Foot



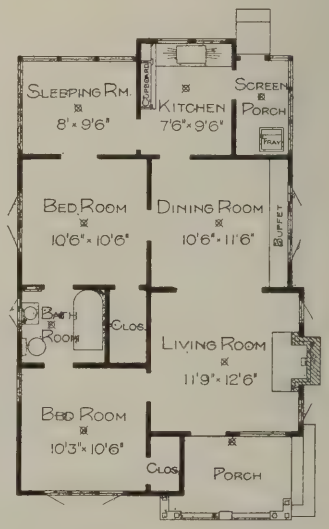
Elevation of Buffet in the Dining Room with Triple Window Above —Scale ⅜ In. to the Foot



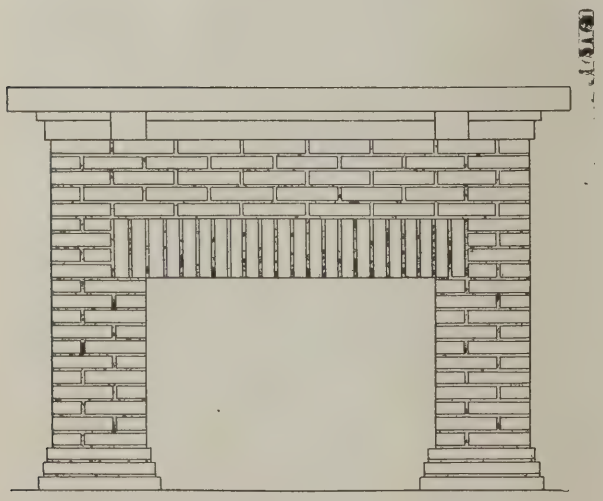
Elevation of Cupboard and Cooler in the Kitchen—Scale ⅜ In. to the Foot



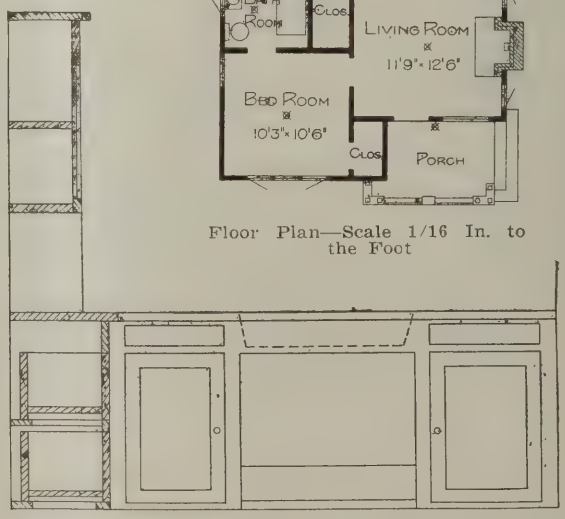
Right Side Elevation—Scale 3/32 In. to the Foot



Floor Plan—Scale 1/16 In. to the Foot



Elevation of Open Fireplace in the Living Room—Scale ½ In. to the Foot



Elevation of Sink and Vertical Section Through Cooler —Scale ⅜ In. to the Foot

ELEVATIONS, PLAN AND DETAILS OF BUNGALOW AT RIGHT HAND ENTRANCE TO THE COURT

hotels were crowded, apartment houses were few and private dwellings at a premium. The municipal authorities, however, became alive to its opportunity and have entered upon a construction era which when brought to a close will see many of the city's needs supplied.

In the climate of Tucson, the screened sleeping porch is indispensable, for practically everybody sleeps out of doors the year round. As a consequence, the apartment building must be equipped with this adjunct of the dwelling and at the same time offer complete privacy. This is not always an easy construction problem for a large building and in casting about for a scheme which would serve the purpose, a Tucson capitalist hit upon a most happy solution. He selected a lot 200 x 180 ft. in size in one of the best residential districts and laid it out to accommodate ten bungalows as shown in the panel picture at the top of the first page of this article. In this way privacy is given to each tenant, sleeping porches are provided and there is a sufficient space between the various houses to allow of a free circulation of air.

No two bungalows are exactly alike, yet all are sufficiently similar to make the entire court attractive. Tenants are not burdened with the trouble and expense of caring for a lawn, though they have the same enjoyment of one as those who rent individual houses with lawns for which care must be taken.

The bungalow illustrated by means of the halftone engravings is the first one shown at the extreme left in the panel picture. A closer view is presented in the larger picture on the same page while an interior view appears upon a following page. The floor plans, elevations and some details of construction here given relate to the bungalow in the foreground at the extreme right, these being in a measure typical of some of the others.

The roof covering is heavy asbestos paper over sheathing boards laid close together. This form of roof is said to keep the rooms cooler in summer than would otherwise be the case.



INTERIOR VIEW OF BUNGALOW SHOWN AT LEFT OF MAIN ENTRANCE TO THE COURT

All rooms are plentifully supplied with windows to give ample light and render them cheerful. The wood finish is of Oregon pine, stained light in some cases and dark in others, the rugs and furnishings being in keeping with the finish.

The living room is provided with a fire-place and the dining room with built-in buffet. In each dining room, near an inside corner, is what appears to be a large door leading to a clothes closet but which in reality is a built-in bed. In some of the bungalows

a bed slides under a bay window and becomes in the daytime a window seat. To the front of each bedroom is the bath room and to the rear a screened sleeping porch, the communicating door being of sufficient width to allow the bed to be pushed in or out with ease. The finish of the bedrooms and bathrooms is in white.

The kitchen, while not large, is well equipped and arranged with all necessary cooking utensils. Glass and silverware, linens and other necessities for the dining room, even to thermos bottles, are provided. An instantaneous water heater supplies both bathroom and kitchen. A furnace is unnecessary as the winters are mild and a basement is not required.

The bungalows are rented for a season, October to May, completely furnished and are said to be much preferred to apartments. An alley runs at the rear of the houses so that trades people find deliveries most convenient.

The collection of bungalows here shown is known as the Hinchcliffe Bungalow Court and is located on Granada Street, Tucson, Arizona. Each bungalow costs on an average, completely furnished, $2,500, but this figure would vary according to locality, much of course depending upon the price of lumber and other materials as well as wages paid.

For the particulars and pictures here presented we are indebted to John F. Myers, secretary of the Chamber of Commerce, Tucson, Arizona.

NATIONAL FORESTS TO SUPPLY WOOD FOR FUEL

In order to meet any possible coal shortage in the West next winter the supervisors of the 153 National Forests will be instructed to afford all possible facilities to local residents wishing to obtain cordwood, which settlers may secure free for the home use, and which is sold at lower rates to persons cutting and hauling in order to sell to others. Since the material that is utilized is mainly dead timber, its removal, it is explained, helps to clear up the forests and thus lessen the fire menace.

Where sawmills are operating in the woods, at points within hauling distance of towns, there will be an opportunity to obtain slabs and other material that ordinarily goes to waste. In order to be sure of a fuel supply, the Government foresters suggest that a good-sized woodpile in the back yard or under cover before winter sets in may be found a thrifty provision.

BUILDING CONSTRUCTION AT SHANGHAI

A description of building construction as practised in foreign countries is always of interest, and the following excerpts from a report by United States Consul General Thomas Sammons dealing with building materials, etc., employed in Shanghai, China, are likely to command more than passing attention.

The native houses are all frame, the uprights being usually native round fir poles, 6 to 8 in. in diameter at the base. Division walls between houses are of 3 in. brick. Joists carrying the floor and roof are round fir poles. The flooring is pine, lap-jointed or tongued and grooved. Doors are of pine, made up of thin boards nailed to a frame. Windows are glazed with fourth quality glass. The stiles of doors and windows, let into the framework at the top and bottom, form hinge bars upon which they move. No hardware is used. Iron work entering into the construction consists only of rain pipes from the roof and nails for the flooring.

The roofs are invariably covered with native tiles of a slate color. This color is not due to the material used, but is the result of the tempering received in the kiln. Before the tiles are brought to such a degree of heat in the kiln as would leave them red afterward, the fire is extinguished and water is poured from the top and is gradually absorbed, in the form of steam, by the half-burned tiles. It is a cheaper process than that used to produce the ordinary brick red.

Oregon pine was formerly gradually supplanting cheaper timbers, such as native and Japanese pine, both in framing and flooring, but it has had a setback since the outbreak of the war, due to the increase in freight rates, as a result of which it cannot compete with the cheaper timbers.

The usual native residence measures 12 ft. in width by 22 to 24 ft. in depth. They are built with a 4 ft. space between the main house and an 8 ft. back lean-to serving as a kitchen, over which is a sun deck, the main house only having an upper floor. There is also an 8 ft. walled front yard. The shop differs from the residence only by the elimination of the front yard, the front of the main house being on the road line.

Concerning building conditions Consul General Sammons says:

The value of buildings under construction in the International Settlement at Shanghai for the first half of 1916 was approximately $2,400,000. This is a remarkable showing when compared with the returns for all of 1915, which aggregated about $3,100,000. These figures represent only the International Settlement. Extensive building operations are also being carried on in the French concession, the Chinese native city, and in the suburbs.

Some idea of the accomplishments of the City and Suburban Homes Company which are of special interest to tenement owners, may be gathered from the fact that the company has provided housing accommodations for over 11,000 people in model tenements in Manhattan; owns and administers a Working Girls' Hotel accommodating 326; is the owner of Homewood, a Brooklyn property, comprising 250 dwellings, and in connection with all of which, the company is helping to solve one of the greatest social problems by making tenements real and permanent homes and creating good citizens by furnishing and maintaining a standard of clean and sanitary quarters and with neighbors who are self-respecting.

SOME OUT-DOOR FURNISHINGS

EXAMPLES OF WORK THE EXPERT CARPENTER WILL FIND OF INTEREST

BY PAUL D. OTTER

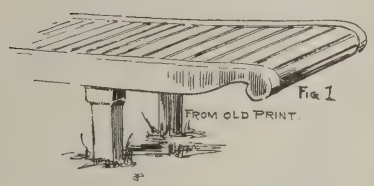
TOO frequently the American garden, lawn, or back lot during the winter months, particularly as one passes over the country westward, is about as dreary to look upon as the cinder yard adjacent to a rolling mill.

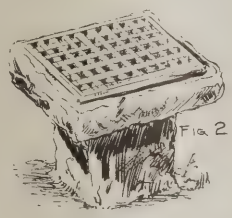
In more established towns and villages the third generation knows nothing of the "Post-Colonial" grape arbor, the latticed summer house at the foot of a pleached* alley, the screened well-curb, the paling fence, and certain triellage work against sunny walls which properly furnished the outer surroundings of old homesteads.

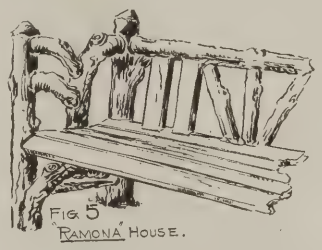
ever new pictures which come with the changing days.

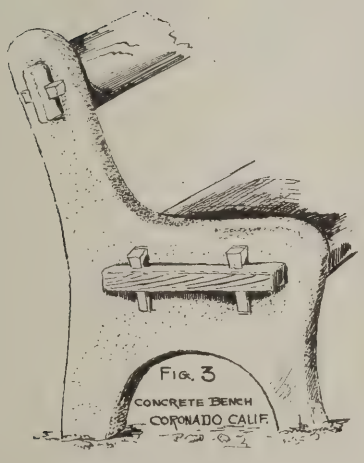
Happily tree planting is becoming a patriotic privilege, and the attractiveness of shrubbery grouping most alluring in selecting such berry-growing varieties which hold their decorative character well through the winter.

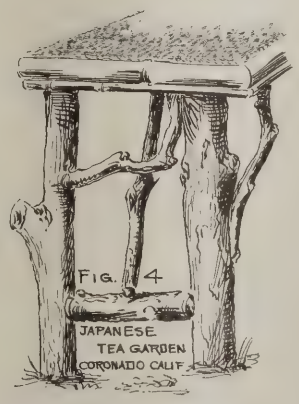
This is a beginning to the attractive features which may with permanence be established about our exterior surroundings. Permanent fixtures which are not only as a trellis to the rapidly developing growth of the summer months, but installed

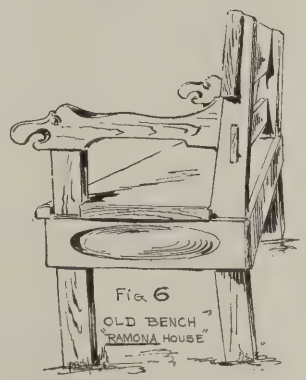












FAC-SIMILES OF SOME OF THE SKETCHES FURNISHED BY THE AUTHOR

Until the restoration a few years ago of the arbor in the form of the present substantial pergola, little attention had been given to vine culture, much less to the grouping of trees in an attractive manner, and particularly shrubbery, which would, during the winter months, afford pleasure to the eye in their leafless condition, capped with snow, or sheathed in sleet, produce as an attractive setting during the leafless period, are also a positive screen to bar out the sordid nature of the public alley, or the unkempt condition of a neighbor's yard. The poet sings—

"Give me an arbor, give me the trellised grape—"

Let us have the arbor, and the trellis too—even though we get no grapes—for we in the city's haven of home retreat may even have these, expecting from long experience the marauder will take care of the grapes, but this should not **sour**

*Mediaeval English or Old French—a wood latticed screen or wall upon which vines or branches were tied, woven or bent down, exposing the fruit to the sun.

us to the beauty of the growing vine. Is not the industry of the busy bee in flower time sufficient recompense, and the combination of the beautiful humming bird quivering before the throat of the corral honeysuckle vine a reward for our outdoor stage-setting?

In the enjoyment of one's outdoor theater circumscribed by one's bit of real estate, the thought of comfort should be well represented in seat, bench, or settle. This thought of comfort was quite absent in the early form of garden and lawn furnishing. Much elaboration was given to erecting a summer house or arbor over a walk for the purpose of securing cool shade and a quiet place of retirement, but the shelf-like seat soon proved such a place to be far from restful, and a return is made to the more comfortable seats of the porch or living room, so often defeating outdoor living.

The depth of all seats should never be less than 16 in., and the back should have an inclination of 3½ in., a height of 24 in.; the seat being inclined ¾ in. from the front edge, and the height of the seat from the ground 17 in. Now that we are seated, interested in outdoor comforts and all accessories which add to the acquiring of that something which makes for a life worth while, let us turn over the sketches and pick out suggestions here and there which were at the time jotted down solely for future modification, or amplification.

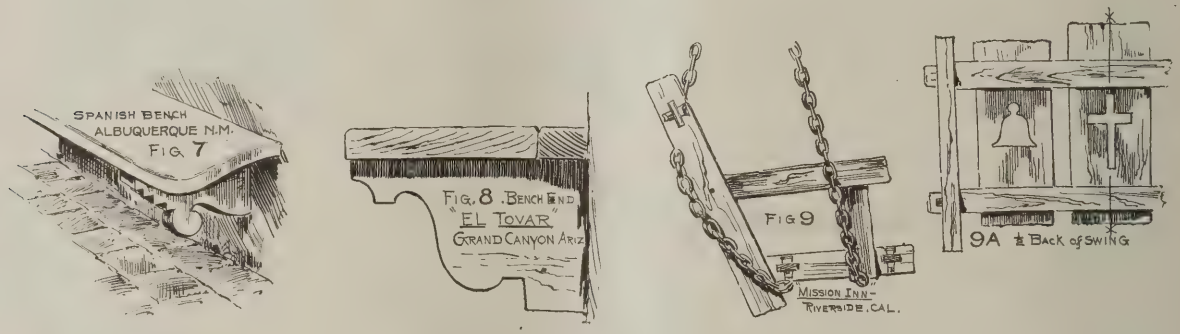
Now it would seem that the suggestion from an old print of settle, Fig. 1, would furnish well a hilltop viewpoint, or as a tennis court bench. This should be one of the fixed seats—for remember the few "rare days," not in June, but frequently in December, February, or March, when after long imprisonment bright sunshine and rare balminess in the air beckon one to pleasant cogitations and calculations on spring planning, and again, what is more beneficent than basking oneself, and turning one's mind, in the warming rays of the spring sun? And who should court every opportunity for quiet meditation but the present-day man? Nothing is so reconstructive as retirement to some pleasant Nature spot for the renewal of the mind and body.

Where the grounds are of some extent, seats should be frequently placed, located for some particular vista, or for the nearby enjoyment of a flower bed, or at different sides of the lawn. Fig. 2 is such, a mere tarrying seat, then off again through the beautiful hotel grounds in Santa Barbara, Cal. The feature of such a seat is from the fact that one knows it is ever ready, after the fresh wind and warming sun have lifted a siege of wet, broody weather.

Then for the seat along the drive, or overlooking the beach, Fig. 3, seen at Coronado Beach, with concrete ends, plank seat and back rail, was particularly enduring, and ever there for those delightful sea pictures unfurled only to those who still have the spirit of the untamed and seek the hardy and wholesome of all—all outdoors—the very utmost.

Not without a certain fitness and expressive of a national trait of ingeniousness was the bench, Fig. 4, seen in a Japanese tea garden at Coronado, rustic with American tree limbs, yet lined around seat edge with a broad, smooth molding of the Japanese bamboo, which trimmed and confined their ever-useful grass matting as a seat cover.

The rustic seat, Fig. 5, at the "Ramona House," San Diego, is not without interest in its combination of tree limbs with smooth seat slats and back splats, while near by in the cool of the deep Spanish veranda there is a curious and very long bench, Fig. 6, part Spanish, yet with a certain Scandinavian treatment in the arm pattern.



A FEW MORE OF THE SAME SORT, THE RUSTIC SWING BEING ESPECIALLY NOTICEABLE

Old Spanish wall benches, Figs. 7 and 8, jutting out from an adobe wall afford inspiration in concrete for striking treatment to that part of any building which faces an attractive view, or is so situated as to invite and retain the warm rays of the sun—to muse—and conclude this is a pretty good world to live in and help to make more attractive.

What an invitation to sit in every seat, bench, and chair in and around that most attractive spot, "The Mission Inn," Riverside, Cal.? For in every bench and settee, new or old garden delights, or conceits, are ever present. Comfort is provided for man, beast, or bird in a most extraordinary way, of having revived all the old quaint things which give charm to garden life. No misunderstood effigies of Grecian senators, carved in slick, white marble standing about as useless orna-

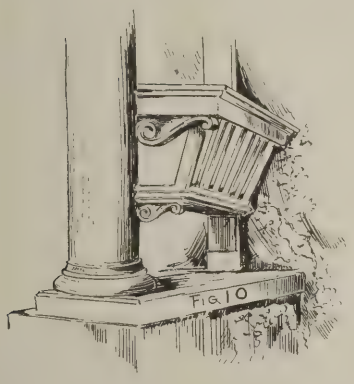
ments—everything here companionable, well used and even weather worn, in tuneful harmony with the suggestive adobe period.

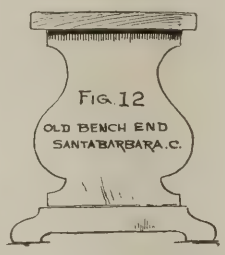
The worn gray and brown swing, Fig. 9, facing the inner court of the *patio*, is indeed refreshing, as it so little suggests a varnished swing bought in a furniture store; rather is it the product of some unskilled artificer who never saw conventional swings, but produced the form in the most direct manner characteristic of place and purpose —this is the spirit of design.

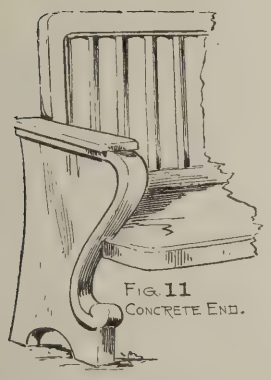
Many pleasing features may be embodied in contemplated alteration work about the house, where it is intended to have concrete take the place of wood. A few sketches given may set the mind to work on many other adaptations of simple architectural forms. Fig. 10 anticipates a side-door stoop seat embodying real comfort in proper depth of seat and inclination of back. Provision is made when pouring for the concrete column to insert the framing for the back rail and classic console brackets. A skillful carpenter may be enlisted in this "Renaissance" of the "Stone Age," as the building trade is now closely identified with "poured" concrete work, and the making of forms and molds has become a recognized part of the builders' art. Naturally a carpenter with an appreciation for the things desired and a sense of form and good line should be engaged—take the bench end, Fig. 11: in cement, one of so many simple classic outlines, the beauty of which depends solely on the clear, easy-flowing curve, ending in the volute. Again the bench end, Fig. 12: in an old Santa Barbara garden, owes its charm, simple though it is, to the easy, full curves.

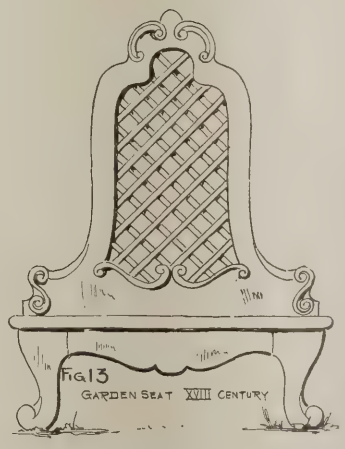
The latticed end to garden seat, Fig. 13, whether in wood or concrete, should have the feeling of the Louis XV style, of which it is a suggestion freed from its full ornamented expression.

Referring again to the lattice, the charm is in the play of lights and shadows throughout the day. The open-work back of wood and concrete bench, Fig. 14, seen in Douglas Park, Chicago, is a modern German form, suggesting many modifications of combined wood and stone, aiming, however, to incline the back of such pretentious efforts so that they will not only be beautiful, but much sought after—and *sat upon*.











SOME GARDEN BENCHES AND SEATS WHICH AFFORD SUGGESTIVE DETAILS FOR THE CARPENTER CLEVER IN THE USE OF HIS TOOLS

DWELLINGS IN ECUADOR

The dwellings of the Indian or Cholo of Ecuador are small "chosas," or huts of the most primitive character, and built of earth in some cases, and merely of paja or upland grass or straw in others. Both by reason of lack of materials and for warmth the huts are of one room only, of small dimensions, and they are absolutely bare of any articles of furniture or means of comfort. The bed is formed of sheepskins laid directly upon the floor, and here the whole family sleep together, with four or five dogs. The fire for cooking is made outdoors with a few stones for backing.

The directors of the Masonic Home near Fort Worth, Tex., recently decided to erect a new boys' dormitory to cost approximately $121,000, and they have just awarded the contract to the Watson Construction Company of Dallas, Tex., who estimate the work can be completed within eight months.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

AUGUST, 1917

SIX MONTHS' BUILDING OPERATIONS

The figures covering the amount of new construction work planned in Greater New York during the first six months of the current year present a most interesting study when contrasted with the figures for the corresponding period a year ago, reflecting as they do the effects of some of the many influences upon business conditions growing out of the European conflict. Owing to the high prices of structural steel and the difficulty which has been experienced in obtaining prompt deliveries, it is not at all surprising to find a heavy falling off in the planning of apartment houses and other buildings involving the use of this material, this being especially noticeable in the Borough of Manhattan, where the figures fell from $52,323,945 in the first six months of 1916 to $21,833,835 in the first half of the current year. The total for the five boroughs this year was $55,152,610, as contrasted with $97,943,561 in the corresponding period of last year. The only borough out of the five constituting Greater New York which showed an increase was Richmond, but the amount was comparatively small. Figuring in the estimated cost of the alterations for which permits were issued in the two periods, the decrease in building operations the first half of this year was practically 41½ per cent as compared with the same period last year.

CLASSIFICATION OF BUILDINGS

As already intimated, much of the decrease in this year's figures was due to the great shrinkage in the planning of apartment houses, hotels, etc., and this is shown in the fact that for the first six months this year permits were taken out in the Boroughs of Manhattan and the Bronx for 73 such buildings to cost $5,726,000, while in the first half of last year permits were granted for 285 apartment houses estimated to cost $27,131,500. Plans were issued for 4 hotels, the estimated cost of which was $2,330,000, while in the first half of last year 14 hotels were planned estimated to cost $15,827,000, these being all in the Borough of Manhattan. Of office buildings in the two boroughs, 19 were planned this year to cost $7,675,600 as against 24 estimated to cost $4,218,500 in the first half of last year. Of store and loft buildings 27 were planned to cost $1,251,200, while in the corresponding period last year 63 were planned to cost $3,849,700. There were 42 manufactories and workshops planned in the two boroughs to cost $1,615,975, and in the first half of last year 37 permits were taken out for such structures estimated to cost $3,650,210. There was a slight increase in the value of the places of amusement planned, permits having been taken out for 84 to cost $2,745,925, while last year for the corresponding period 34 permits were issued for such buildings to cost $2,301,050. The steady increase in the use of automobiles has for some time past created a great demand for housing accommodations, and as a consequence permits for garages have been on the increase. For the first half of this year there were 164 stables and garages planned estimated to cost $2,234,200, while in the first half of last year 105 such buildings were planned to cost $2,150,915. One influence which was not without its effect in stimulating the filing of plans for tall buildings last June to an unusual extent was the expectation of the early going into effect of the zoning law and the measure restricting the heights of buildings.

BUILDING IN BROOKLYN

In Brooklyn the discrepancy between the two half years is not so marked, new construction work this year figuring at $18,694,200 as against $20,560,730 for the first six months of 1916. In this borough there has also been a marked falling off in the planning of tenements, the estimated cost of those for which permits were issued being $4,507,000 and

$7,779,000 respectively for the two periods. Dwelling house construction of brick fell from $3,137,450 in the first six months of 1916 to $949,950 in the first half of this year. In this connection it is to be noted that the number of store buildings planned last year with upper stories arranged for two families was 554, estimated to cost $3,332,100, while for the same period this year only 84 were planned, to cost $511,500. Stables and garages were planned the first half of this year to the number of 302, estimated to cost $1,334,750, against 252 costing $725,300 in the same time last year. Another feature of special interest is found in the frame dwelling houses for one and two families for which permits were taken out in this borough, the figures being 637 buildings to cost $1,790,300 and 596 to cost $1,891,870 respectively in the two periods. Of brick factories and workshops, 47 were planned this year to cost $2,434,300 against 55 a year ago estimated to cost $1,526,250.

CHICAGO CEMENT SHOW

We learn from Secretary B. S. Smith of the Cement Products Exhibition Company that it has been decided, in view of existing conditions, not to hold the usual Chicago Annual Cement Show next winter.

LIFE OF A SKYSCRAPER

Much interest has been developed in recent years regarding the life of a steel skeleton frame building and no little discussion of the subject has appeared in the trade press. Several buildings of this type have been razed and the condition of the steel frame carefully examined with few signs of rust or deterioration. The first in New York City to be demolished was the Tower Building on lower Broadway after it had stood for a quarter of a century. Another was the Gillender Building, a nineteen-story structure demolished in the summer of 1910, after it had stood for less than 12 years, to make room for the present Bankers Trust Building. In both instances the steel frame work was found in "remarkably good condition."

In later years came the razing of the Hoffman House and Albemarle Hotel to provide a site for a commercial structure. The report of the building department has this to say regarding the demolition of the steel frame addition to the Albemarle Hotel, which was completed in December, 1907, and torn down in the summer of 1915, making seven and one-half years as the life of the structure.

"The walls were of the skeleton type 12 in. thick for the uppermost 75 ft. of height and thence increased 4 in. in thickness for each lower 60 ft. or fraction thereof. For floors 9 and 10-in. terra cotta flat arches sprung between steel beams were used, with the usual 2 in. cinder fill between the sleepers and a double wood flooring. The partition walls throughout the building were of terra cotta blocks plastered on both sides. All interior columns were encased in 2 in. terra cotta block while the customary 4 and 8 in. of brickwork was used for exterior and wall columns.

"The foundation consisted of concrete piers in open caissons carried down to rock at a depth of about 37 ft. below curb.

"Throughout the entire structure there was an absence of any cases of severe rusting."

BRIDGEPORT TO ERECT MANY BRICK HOUSES

The building committee of the Bridgeport Housing Company has authorized the opening up of the large development at Lordship Park, Bridgeport, Conn., where several hundred brick houses are to be erected in the Colonial style. The plans of R. Clipston Sturgis, national authority on the garden city type of development, and who had entire charge of laying out the Fairfield village of 300 homes, will also be used in this connection.

MINIATURE THEATER ON HOTEL ROOF

One of the curiosities in New York City in the way of a place of amusement is found in the tiny theater that has just been completed on the roof of the Hotel Majestic at Central Park West and Seventy-second Street. It is referred to as a "pocket" playhouse on account of its size. The new theater is modelled after the playhouse conducted before the war by Madame Strindberg atop of a London theater. Its actual seating capacity is ten persons, the rest of the audience sitting at dining tables distributed around the roof. The stage of the theater is 10 ft. wide and 6 ft. high and forms a perfect proscenium, being built of bamboo. There is no scenery, but white curtained drops are used upon which will be thrown the scenic effects by means of a stereopticon.

Complete sketches are presented, the longest of which lasts for twelve minutes, the actors who will present them being from the Theatre Français in Paris and who are now in America.

It is said that in France they are building houses from concrete made of ground slag mixed with hydraulic lime in the proportion of three sacks of lime to one cubic yard of slag. The mixture is known as *"pise de machefer."* It is rammed between wooden frames to form walls about 18 in. thick. It is used for every kind of building including cottages, country houses, warehouses, factories, etc.

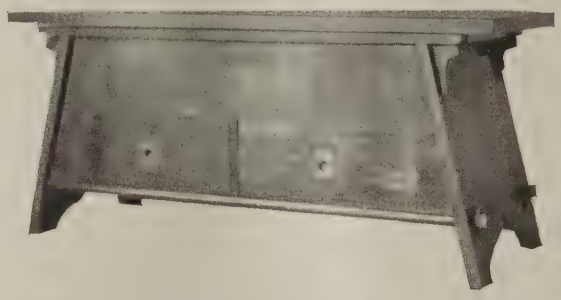
One of the many uses made of reinforced concrete is monumental flag poles. One of these measuring 60 ft. in height and ranging in diameter from 16 in. at the bottom to 8 in. at the top has been erected on the soldiers' burial plot of Winfield Scott Post No. 73, Department of New Jersey, G. A. R. The contractor was R. T. Bush of Plainfield, N. J.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

A CONVENIENT WINDOW SEAT

From C. D. Gilbert, Detroit, Mich.—It has occurred to me that readers of THE BUILDING AGE might possibly be interested in some furniture which I have recently made, and I am therefore enclosing a description of a combination window seat and chest. The top of the chest lifts up disclosing a spacious tray for half completed garments, while the two drawers hold a comprehensive repair kit. The chest may be made of any hard wood, but oak is probably the most satisfactory. The lumber can be ordered in board form and the parts glued, or the gluing may be done at the mill, according to one's facilities for doing the work.

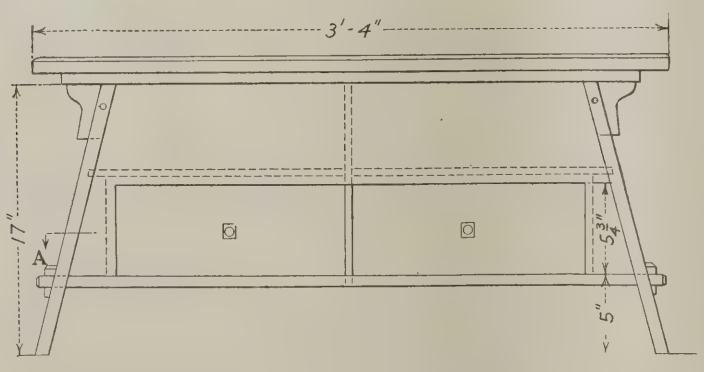


Appearance of the Finished Window Seat or Chest

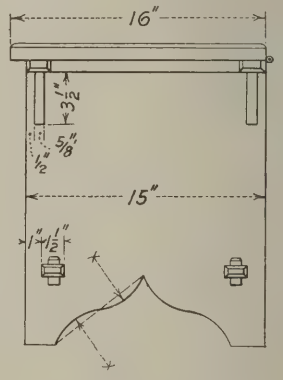
The first step is to make the ends. Piece No. 2 is cut in the middle and carefully jointed, Measuring from the center 6 in. each way, mark for the dowels; locate another dowel about 4 in. from the ends of the boards. Glue up these pieces and when dry mark out the bottom of the legs, working from a center line squared across the middle of the board. Now cut out the irregular shaped piece, leaving the two ends still together. This makes it much easier to hold the work than if each leg is worked separately. Locate and make mortises, which are at an angle to the face of the work; it is best to make a rough full size elevation and take the proper angle with a bevel. Cut the mortises at the top of the ends to receive the sides and smooth up the work. While working the ends the back and front should be glued up. The front should have glue only at the ends outside the drawers, so the drawer front can be cut out later and when complete the front will show a continuous grain.

Make and glue the bottom frame and also the white wood tray bottom, and while they are setting smooth up the front and back and cut them to shape.

With these parts finished, carefully assemble the box, making sure everything fits perfectly. Now mark the exact position of the tray bottom at each corner and work the grooves to receive it. Cut the tray bottom to shape, also the pieces at the outer ends of the drawer, which support the front, and form drawer slides. Mark and carefully cut out the drawer fronts in one piece, to be separated later. Now assemble the box, using glue at all points of contact. Drive the wedges in the bottom frame snugly, but carefully. Pin the legs through the front and back and mortise through the tray bottom after it is in place to receive verticle strips, which stiffen the front and back. The front strip also makes a parting for the drawers. These strips are framed through the bottom and screwed to the front and back. As the front strip must come flush with the face of the work it will be necessary to cut the front mortise in the tray bottom back ⅝ in. and



Front Elevation Showing Various Dimensions



End Elevation

SOME OF THE DETAILS OF CONSTRUCTION—SCALE 1 IN. TO THE FOOT

plug the space left after the parting strip is in place. The drawers can now be made and fitted and the top frame put in place and secured by screws. The top is doweled, glued and trimmed.

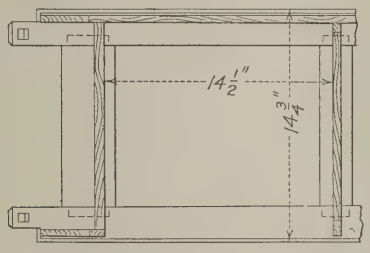
All surfaces should be very carefully smoothed with scraper and sandpaper.

The lumber bill is as follows:

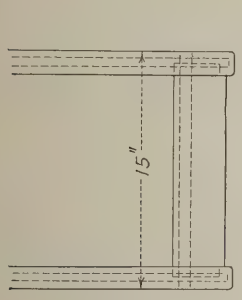
1 piece 1⅛"x8"x7' for top. 1 piece 13/16"x8"x8' for ends. 1 piece ⅝"x7"x14' for front and back. 1 piece 13/16"x3½"x14' for top, bottom and frames.	Oak
1 piece ½"x7"x12' for drawer sides and tray bottom. 1 piece 1/14"x7"x5' for drawer bottoms.	Whitewood

Drawer pulls can be selected to suit individual taste. Flush rings look well and are out of the way. The top is hinged with wide hinges. There is an H-shaped hinge sold that is especially well adapted to this place.

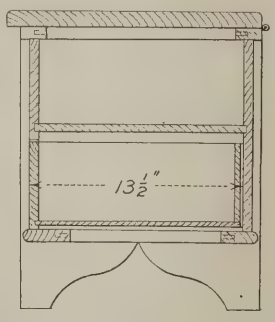
The finish to be applied is also a matter of taste, but a durable and very satisfactory job is secured



Section of Window Seat at "A" of the Front Elevation, with End Removed



Detail of Top Frame



Vertical Cross Section

DETAILS OF A CONVENIENT WINDOW SEAT

by a coat of penetrating stain of the desired shade followed by an application of wood filler and a coat of shellac.

Fine sandpaper must be used between coats. The shellac when hard should be lightly sanded and a coat of wax applied and polished with a soft cloth.

WHAT PRACTICAL BUILDERS SAY OF BUILDING AGE

From Wells Bros., Contractors and Builders, Scottsville, N. Y.—As being of possible interest to other readers of BUILDING AGE we desire to say that it is the most practical and helpful paper that is printed for builders engaged in the business. I have been one of the old subscribers to the paper when it was known as *Carpentry and Building*. It has been a great help to the writer and I shall do all that I can to help others in seeing the advantages of it.

NEW METHOD OF TANGENT SYSTEM OF HANDRAILING

From James Bruce, Wanganui, New Zealand.—I received my copy of the BUILDING AGE for February the latter part of April and was very much pleased with the article on handrailing by C. F. Stark. I was under the impression that the last word on the subject had been written years ago, and although I understand the subject as treated by descriptive geometry, I have never thought of applying geometric conics to the subject. I would be pleased if Mr. Stark will at some time favor the readers of the paper with his proofs of the system. I have tried to analyze it, but am not very well satisfied with my work; still, if our worthy editor can find space for the matter, it may interest some of the readers.

Using Mr. Stark's figures in the February number, I would say that I do not consider the construction for finding the point O in Fig. 1 necessary. It may be taken direct from the elevation.

Now to find the focii. By looking at the complete drawing of the face mold, Fig. 5, we notice the tangents will be equal and parallel to the springing lines semi-conjugate diameters, the squares on which are equal to the squares on the semi-major and semi-minor axes.

We will talk of the tangents as though they were their equals—the semi-conjugate axes. Now the squares on the tangents are each equal to the squares on the semi-minor axes and their respective rises, therefore

$OR^2 + OM^2 + OR^2 + OA^2 = OR^2 +$ the semi-major axes^2.

Subtracting 2 OR^2 from both sides of the equation gives us

$OM^2 + OA^2 =$ semi-major axes$^2 - OR^2$

but the semi-major$^2 - OR^2$ (semi-minor) = the square on OF.

Therefore $OM^2 + OA^2 = OF^2$.

Hence the construction in Fig. 1 for finding the focii, Fig. 2, is easily followed and calls for no particular comment.

In Fig. 3 I notice Mr. Stark has made use of the feat used by many handrailers for finding the bevels in these cases—but the length of the tangent as a base and the rise of the other tangent gives the bevel. But what I noticed in Fig. 3 is that it also gives the length of the semi-major axis and that the rectangle under the sum and difference of the semi-major axis and the rise is equal to the square on the tangent.

The proof is that the square on the tangent is equal to the square on the rise plus the square on the semi-minor axis in each case as before stated, and the squares on the tangent are equal to the

square on the semi-major axis plus the square on the semi-minor axis.

Now the bevel is found by using the tangent for a base and the other rise for a perpendicular. The square on the tangent used plus the square on the other rise, plus the square on the semi-minor axis equals the squares on the semi-minor axis plus the square on the semi-major axis. Subtracting the square on the semi-minor from each side, tne square on the tangent plus the square on the rise equals the square on the semi-major axis as in Fig. 3. Fig. 4 calls for no comment.

In conclusion permit me to tender my thanks to Mr. Stark for his article, and I hope to see more from his pen. I am free to state that I know more now about handrailing since reading his article than I did before.

WHY WALLS OF HOUSE SWEAT

From A. R. F., Rochester, N. Y.—In the answer to the question of "S. B." of Weston, W. Va., as to why the walls of his house sweat, the note by the editor in the June issue gives the chimney as the probable trouble. This is all right so far as the chimney end of the matter is concerned, but I question if it is the real explanation. For twenty years I lived in the natural gas and oil country and during that period occupied many houses, some of which sweat and others did not sweat. I never, however, found one that was affected in just the same way as the house described by "S. B."

All of the houses that were affected seemed to sweat more near the floor on the side walls, and on the outside walls only. I never saw a house sweat that had a cellar or foundation wall under it. It was always the house that had underpinning under it that did the sweating, and I think that this was the real cause of the trouble. A house with underpinning does not have the warm, dry air under it that a house does with a foundation or cellar wall. With the underpinning the frost and cold air can find a free passage up between the outside sheathing and the plaster. The heat from the fire inside is bound to draw the frost through the plaster which will cause wet walls in spite of all that one can do to prevent it. A house with a cellar under it will have the warm air from the cellar circulating between the exterior siding and the plastered wall, and this will have a tendency to prevent the frost from coming through to the plaster.

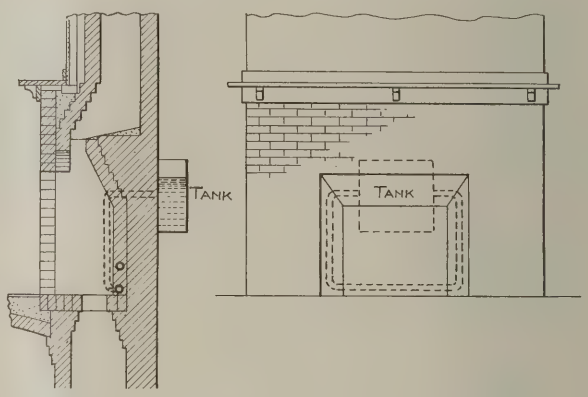
Some of the houses in the oil and gas country do not have stud frames, but are merely lathed and plastered on the exterior sheathing. I have seen many of such construction. In this case it is impossible to keep the walls dry. The hotter the fire in the house the more frost it will draw through the walls. Many other oil and gas country houses are not plastered at all, but are muslined and papered. These houses seldom sweat at all.

The correspondent does not say if it is the ceiling on the first floor or the second floor that bothers him, but I would wager that it is the second floor next to the roof. If his house is only one story in height, as most of the houses are in the oil and gas country, I would say that the sweating is caused by the frost coming through from the roof. Perhaps if he can lay a good, tight floor on top of the ceiling beams it will help some.

Natural gas stoves should always be "closed stoves" and should never be operated without a stove pipe. A good flue should also be provided. If "S. B." will keep nearly as much heat in the house at night as he does in the daytime, I think he will find it will help some. Turning the gas too low at night also allows the frost to get in the walls.

FIREPLACE WITH WATER HEATER

From J. R., Greenville, S. C.—Will some of the practical readers post me through the Correspondence Department regarding a system by which I could construct a water heating arrangement in conjunction with an open fireplace? The sketch which I am sending shows the pipe running horizontally back of the fire and down and



FIREPLACE WITH WATER HEATER

up in the corners of the end of the fireplace, passing into a tank which is on the opposite side. I believe water-pipe coils efficiently installed, somewhat as shown, would be a saving of heat and exceedingly useful for household purposes. Any information, therefore, which may be vouchsafed me will be greatly appreciated and it is possible that other readers may also benefit thereby.

CUTS FOR HIPS AND VALLEY RAFTERS

From G. L. McM., Tacoma, Wash.—Answering the request of "W. W." for information as to the treatment of hips and valleys at the bottom cuts, Fig. 1 is the plan and elevation of a hip showing the plates at the corner and the cut at the bottom of the hip. Fig. 2 is the elevation of the bottom cut of the corresponding common rafter. In order that the roof sheathing should rest on the hip or valley it is necessary that the top edge of the hip should lie in the same plane as the top of the common rafters; in other words, the distance (measured

on the line of the plumb cut) from the edge of the plate, where the edge of the hip intersects it, should be the same as the distance from the plate to the top edge of the common rafter at the same point.

Referring to Fig. 1 it will be seen that the point *a* on the plan and the line *a-e* on the elevation are the points from which the length of the hip is measured, but that the side of the hip intersects the edge of the plate at the point *b* on the plan. Therefore if *a-b* on the elevation is made equal to *a-b* on the plan and *b-d* on the elevation is made equal to *b-d*, Fig. 3, on the common rafter and the level cut of the hip is made through *b* from *c* to *a*, and the plumb cut is made through *a* it is evident that the top edge of the hip will lie in the same plane as the top of the common rafters, and that the hip will receive the under side of the sheathing boards as required. If the distance *a-e* on the hip is made equal to *b-d* on the common rafter, Fig. 3, it will be necessary to "back" the hip as indicated by the sections on the plan.

The method of finding the backing is shown on the elevation. Make *g-i* equal to *a-b* on the plan or one-half the thickness of the hip. Make *i-n* equal to *g-h* (*g-i* being the level cut), and the line *j-k* through *n* will give the amount to be backed off, working to the center of the hip.

This is unnecessary work, however, as the same result in the end is secured by making the level cut as shown at first. If the planceer is applied to the bottoms of the rafters they will doubtless be ripped down as shown by the dotted line on the common rafter, in which case it will be either necessary to furr down the side of the hip slightly, as indicated by the dotted line on the hip elevation, Fig. 1, to receive the planceer, or else to rip the hip at the dotted line and channel it as indicated on the plan below the plates.

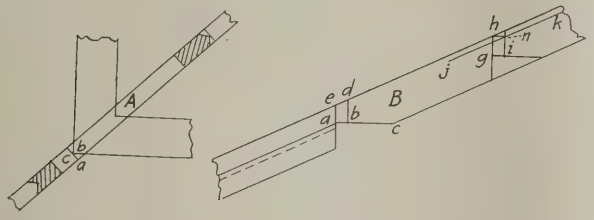


Fig. 1—Plan and Elevation of Hip Rafter Showing the Cut at the Bottom

Valleys require a somewhat different treatment. Fig. 2 shows the corresponding plan and elevation of a valley rafter. It will be noted that the point *e* on the plan and the line *e-d* on the elevation are the points from which the length of the valley is measured while the plumb cut is made at the line *b-a*. The distance *c-a* on the elevation is made equal to *c-a* on the plan and *c-d* on the hip equal to *b-d* on the common rafter, Fig. 3, which brings the center of the valley in the same plane as the tops of the common rafters and in line to receive the bottom side of the sheathing boards. The valley sheathing being cut with the long point of the bevel through the board on the bottom, this will strike the center of the valley.

The edge of the valley will be slightly below the plane of the tops of the common rafters, and it will be necessary to raise the jack rafters so that the top edge, extended, will strike the center of the valley as indicated in Fig. 4. If the distance *a-e* on the valley is made equal to *b-d* on the common rafter the edge of the valley will be in the same plane as the tops of the common rafters, but the center will be higher and it will be necessary to channel the valley as shown in the section on the plan. If the planceer is applied directly to the under side of the rafters, and they are ripped as indicated by the dotted lines, the bottom of the valley below the plate will require no further treatment, as it is virtually a hip, upside down, and in line with the under side of the common rafters.

If "W. W." will try framing his hips and valleys as here shown, and study them somewhat, he will soon understand the reasons underlying this method and be able to work out the slight variations necessary to fit special conditions.

I have assumed that the roofs each side of the hip or valley are of the same pitch. Different pitches would require especial treatment.

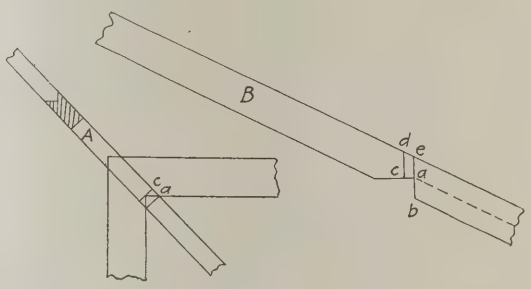


Fig. 2—Plan and Elevation of Corresponding Common Rafter with Bottom Cut

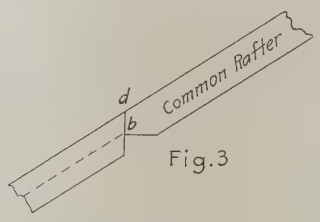


Fig. 3—Elevation of the Cut, Common Rafter

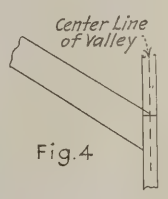


Fig. 4—Framing the Jacks

CUTS FOR HIPS AND VALLEY RAFTERS AS EXPLAINED BY "G. L. McM"

REMEDYING A SQUEAKY FLOOR

From W. J. M., Lakewood, Ohio.—I would like to hear through the Correspondence Department of the paper of some way to stop a squeaky floor. The house is only two years old and the floor is of 2 in. oak, natural stain, and every board has a squeak all its own. I have tried to get oil between the joints but the boards fit too snug to allow the oil to enter.

CONSTRUCTING A GOTHIC ROOF FOR BARNS

From C. E. K., Fiske, Saskatchewan, Canada.—I would like to see in the correspondence department a discussion of the different methods of constructing a Gothic roof for barns, and an explanation of the easiest way to obtain the proper bevel for the cut of the rafters on a Gambrel roof where the two rafters—the upper and the lower—meet.

PLUMBING SYSTEM FOR FARM HOUSE

From John Upton, LaFargeville, N. Y.—In reply to the questions of "G. A. L." in a recent issue of the paper, I would say that only a general idea can be given without having a plan of the house before me, but a few suggestions may prove of value. As water is to be drawn from a well, a small storage tank may be installed in the attic into which the water may be pumped by hand, windmill or engine. As an alternative he may use a pneumatic pressure storage tank in the cellar which can be filled with water either by hand or power. The gravity system is cheaper but the pneumatic system is more satisfactory, according to my way of thinking.

A bath room may be placed on either the first or second floor or there may be one on both. It should be as near the kitchen as possible, either directly above it or at one side so as to avoid long runs of pipe. Hot and cold water should be provided for the lavatory and bath, also cold water for the closet tank. The waste pipes from the lavatory and the bath tub should be let into the soil pipe from the closet, so these should be placed as near together as may be convenient.

The sink should be placed in the kitchen and if water is to be pumped by hand a small force pump could be used to furnish fresh water for drinking purposes and also to force the water to the attic tank.

If, however, much water is to be used a double acting horizontal hand pump in the basement might prove more satisfactory. A 30 x 40-gal. range boiler connected to the kitchen range should provide the needed hot water.

A set of stationary laundry tubs will be found a great convenience in the farm house. Each should be provided with hot and cold water as well as waste pipes, the latter being trapped close to the fixtures. The closet has its trap within itself and the waste soil pipe into which it empties should run up through the roof for ventilation.

The correspondent states that the sewage is to go into a cesspool. The modern septic tank is the best way to dispose of sewage on the farm. A catch basin is sometimes put in to receive the water from the kitchen sink and separate the grease before the water goes to the septic tank. The construction of the modern septic tank is very simple, consisting of two compartments, the first having baffle boards so that the incoming sewage will not disturb the scum which forms on the liquid. From this chamber it passes to the second from which it is automatically emptied by syphon whenever it becomes full.

BEST PRACTICE IN LOCATING WINDOWS

From A. R. F., Rochester, N. Y.—In answer to the question of "R. A. D.," New Castle, Pa., and which appeared in the May issue of the Building Age, I take pleasure in suggesting the following as regards the best practice in locating windows:

In my own experience I have always located the window openings in accordance with the door openings; that is, I locate the windows by the doors, so that the tops of the window frames will be level and in the same plane with the tops of the door frames; then let the bottom of sill of the window come where it will. I think it always looks better to have the top of the window frame level with the top of the door frame, and in most all cases this scheme works, especially with ordinary size doors and windows, but anything out of the ordinary size will have to be worked out to the best advantage.

The area of window surface should be about one-eighth of the wall surface. The area of glass should be at least one-tenth of the floor area, one square foot of glass to be allowed for each 100 cu. ft. of interior space to be lighted. The height of the window should be twice its width.

In the second floor or sleeping rooms the window heads should be as near the ceiling as the construction and interior scheme will permit. This will give better light and ventilation.

CASTING COMPOSITION ORNAMENTS

From C. W. J., Waterbury, Conn.—Will some of the practical readers give me through the correspondence columns information regarding the ingredients used in casting composition ornaments such as are used in the decoration of interior woodwork.

PASSAIC MASTER BUILDERS' ASSOCIATION

At a recent meeting of leading contractors in Passaic, N. J., a master builders' association was organized with officers as follows:

President.....Siebe Rossman
First Vice-president....Albert Martin, Jr.
Second Vice-president.....Herbert Snoop
Treasurer.....John Berridge
Secretary.....Thomas A. Hopkins

It is the intention of the association to induce all masons, carpenters and representatives of other branches of the building industry to become members, and a campaign for that purpose has been started.



A WELL PLANNED HOUSE FOR THE SUBURBS—ARCHITECT, GEORGE P. CARVER, BOSTON, MASS.

A WELL PLANNED HOUSE FOR THE SUBURBS

DESIGN OF UNUSUALLY CONVENIENT ARRANGEMENT—DETAILS VERY CAREFULLY CONSIDERED

WE have selected for the basis of our supplemental plate this month a suburban home of unusual convenience in its layout of rooms and one in which the architect has utilized to good advantage practically every inch of available space. In fact, he refers to it as a "model suburban residence," and we have no doubt that it will prove of more than passing interest to a large class of our readers by reason of the suggestions which are to be found in a careful study of the floor plans presented herewith.



THE LIVING ROOM WITH ITS BRICK FIREPLACE AND THE DINING ROOM BEYOND

The exterior frame is covered with sheathing boards, over which is placed a layer of building paper, and this in turn covered with shingles stained a dark green color. All trimmings are painted a cream color.

A covered veranda or piazza of about 500 sq. ft. extends on two sides, and this when suitably furnished would make it the most used part of the house during the summer months.

An examination of the first floor plan shows the space to be divided into reception hall, commodious living room, dining room and kitchen, with pantry between. The feature of the living room is the open fireplace. Another feature of the main floor arrangement is the combination flight of stairs with its broad landing lighted by an extension window and provided with seat.

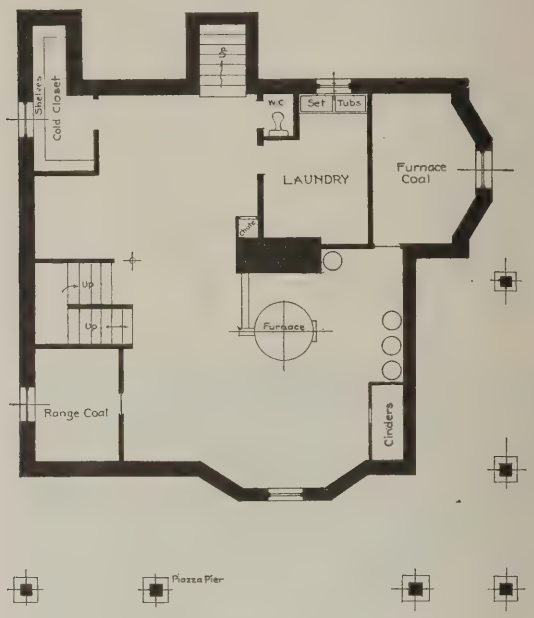
The second floor is divided into three well-lighted and ventilated sleeping rooms, a den, a bathroom and a large central hall, from which all rooms are readily reached. There is a clothes chute opening from this hall and also a linen closet provided with shelves. Each sleeping room also has a commodious clothes closet. If the exigencies of the case demand, the den can be utilized as a sleeping room. Should the owner so desire, the room might during construction be laid out as an additional bathroom with large closet and jog for an enclosed shower.

On the third floor arrangement is made for two good-sized sleeping rooms and unfinished attic space for storage purposes.

The basement or cellar has a concrete floor and is divided into cold closet, laundry, and bins for range and furnace coal. The range coal bin is conveniently located near the foot of the stairs and the furnace coal bin is placed near the furnace.

The floors of the rooms in the first story are quartered oak with the exception of the kitchen and pantry, where there is a plastic sanitary flooring

with sanitary corners and base boards. The living room is finished in quartered oak with a weathered stain finish. The ceiling is finished with false beams and the plaster panels between are tinted a cream color. The bookcase and seat in this room are built-in and paneled in oak.

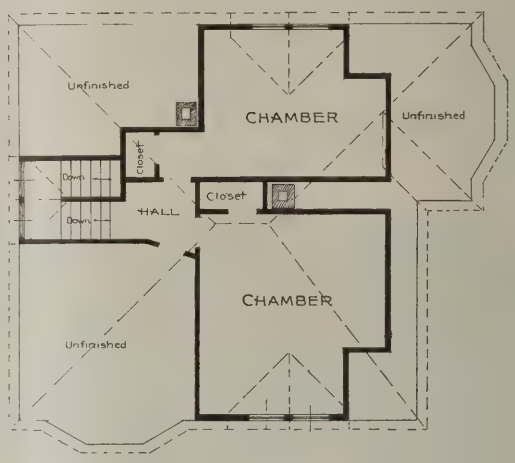


Basement Plan

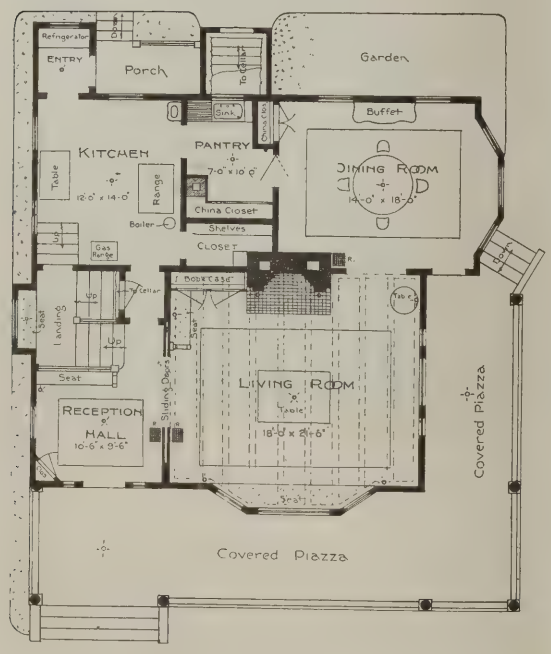
with full length mirror, and there is also a built-in seat with paneled back at the side of the stairway, all as shown on the main floor plan.

The dining room has a white wood finish painted white, and there is a built-in china closet with leaded glass doors, plate glass shelves and a plate glass mirror back. There is a leaded glass door from the dining room leading to the porch.

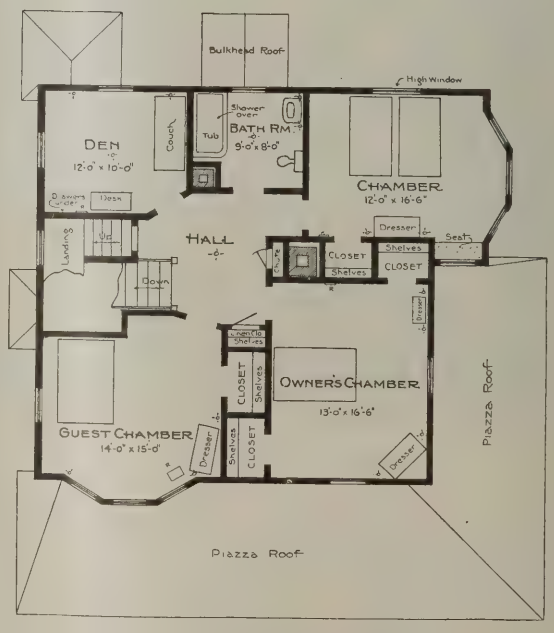
The floors of the rooms in the second story are first quality narrow maple and the finish of all the sleeping rooms is white wood painted white. The



Attic Plan with Outline of the Roof



Main Floor Plan


Bulkhead Roof
High Window
DEN
12'-0" x 10'-0"
Couch
Shower over
Tub
BATH RM.
9'-0" x 8'-0"
CHAMBER
12'-0" x 16'-6"
Dresser
Seat
Shelves
CLOSET
Shelves
CLOSET
Dresser
Dresser
Dresser



VIEW IN THE RECEPTION HALL, LOOKING TOWARD THE DOOR TO THE KITCHEN

The bathroom fixtures consist of tub with shower over, water closet and lavatory of a design suitable to the owner.

The sleeping rooms on the third floor have maple floors with white wood trim painted white. Each room has ample closet space and built-in seats have storage space underneath.

The house is piped for gas and wired for electricity and the fixtures are of the combination type.

The house was designed by Architect George P. Carver of 53 State Street, Boston, Mass., who states that the cost to build a residence of this kind is governed to a large extent by the kind of floors, finish, and fixtures used, and will also vary in large measure in accordance with the grade of material which may be utilized in its construction. As here shown and described, Mr. Carver states that the house can be built for $5,500, the location being in



THE COMMODIOUS LIVING ROOM AS VIEWED FROM THE RECEPTION HALL

the vicinity of the city of Boston, Mass.

The building contractor executing the work was Prince Ober, of Beverly, Mass.

DEVELOPMENT OF THE PERGOLA

To Italy, the land of art and architecture, appropriately belongs credit for the introduction of the pergola. It was an added note of beauty to the general plan of Italian home and garden architecture. Other features that recommended the structure were undoubtedly recognized by the Italian, says the *Architect and Engineer,* but its artistic possibilities were considered the most important.

Work of the Britisher

Without losing sight of the chief reason for its origin, it remained for the more practical Britisher to adopt and develop the pergola from a different viewpoint. Its restful and satisfying influence was in strict accord with his idea of home environment; sheltered and protected from the highway, it afforded the family the seclusion which characterizes the British home, while it placed no restraint whatsoever upon the native enthusiasm for outdoor life.

In America, up until recent years, the pergola had a much harder task in finding popular favor. The free and easy manner of the people was in direct contrast with that of their European cousins and consequently the proverbial front porch was not going to be readily superseded.

Position of the Pergola

Usually situated within hailing distance of the sidewalk, without even the semblance of a hedge-fence between, the front porch permitted of the exchange of greetings and of discussion of the live topics of the day with passing friends. The disadvantages of such a congenial rendezvous were thus, for a time, overlooked, and in the meanwhile the pergola made but slow progress. A keener appreciation of the benefits to be derived from a closer association with nature, however, particularly noticeable in America, emphasized the merits of the pergola and practically resulted in the abandonment of the old style porch, which, with its solid roof, unduly darkens the entrance and excludes both sunshine and fresh air, which would otherwise find their way into the first story of the home.

Sanitary Environment

Thus, in line with the modern idea of sanitary environment, we find provision made for the dignified and artistic pergola-porch, the sun parlor, the solarium, the outdoor living-room, sleeping-chamber and the pergola, a boon which is also enjoyed by the city dweller, the present-day apartment building being equipped with one or more of these features considered essential in the matter of right living.

In design the pergola varies to as great an extent as do the materials with which it is built, nevertheless the element of beauty is always present. The square stone piers, supporting a frame work of timber, is responsible for the grandeur of the Italian structure. Rustic work, which never fails to attract and please the eye, is generally followed in England, the pergola there consisting of larch poles, supported on stout wooden posts, while the concrete pergola is naturally of a distinctly American type.

Concrete also appeals to the American. Its permanence is undisputed. It may be molded to any detail, no matter how fastidious the prospective builder may be, and its cost is not prohibitive to the home-owning citizen. It may be dark or it may be light of color, much depends upon the materials with which it is made, but if care is exercised in their selection as is necessary, in choosing the pergola site, and again necessary in planting the vines and creepers around the columns, so that the structure becomes a part of and harmonizes with the home itself and the surrounding trees and shrubbery, then the possibility of spoiling the landscape with a structure of "lifeless" appearance is readily overcome.

A TRIANGULAR HOUSE

The most peculiar house in the United Kingdom is probably the triangular one at Rushton, Northamptonshire. Its design is supposed to typify the trinity. This building has three stories, and each story has three windows on each of the three sides, while each of the windows in two of the three stories is in the shape of a trefoil—the three-leaved shamrock. In each of the other windows there are twelve panes, arranged in three fours, and the panes throughout are triangular.

Three gables rise on each side, and from the center, where their roofs meet, a three-sided chimney, surmounted by a triangular pyramid, terminates in a large trefoil, and the smoke issues from three round holes on each of the three sides of the chimney. Three Latin inscriptions, one on each side of the house, have each thirty letters, while over the door there is another Latin inscription of three words, the English of which is "There are three that bear record," and on each side are the carved figures of three angels bearing shields. Inside the house each floor contains three three-sided apartments. The length of each of the walls by outside measurement is 33 ft. 4 in.—that is, exactly 33 1/3 ft.—*Stone.*

In view of the terrific and destructive tornadoes which have been sweeping some of the Western States this season, Kansas is said to be building cyclone cellars faster than it is doing anything else. Contractors throughout the State are said to have work engaged for weeks ahead building these cellars. Already there have been nine tornadoes in the State causing a death toll of 31 and a property damage approximating $7,000,000.

The National Housing Association has decided to hold its annual meeting in the city of Chicago, Oct. 15 to 17, with headquarters at Hotel La Salle.

"KINKS" FROM A CARPENTER'S DIARY

FOREMAN SHOULD BE EXPERIENCED IN HANDLING MEN AND MATERIALS AND SUPERVISING THE WORK

BY HAMMER AND SAW

APPLYING for work on a factory construction job last summer, the carpenter foreman said in reply to my request:

"All right, come in the morning. Got any tools?"

"Yes."

"Well, bring a saw and hammer."

"And square, too?" I added.

After rubbing his nose for a time the foreman asked: "Have you one of those things?"

"Yes."

"Well, you might bring it, although we don't use it much any more."

This foreman was entirely capable not only in his trade, but in handling men and materials and supervising the work, yet the contracting firm lost money on the job.

When asked why they lost out the foreman explained in two words, "Incompetent help. The bid was all right, other expenses were figured to a minimum, but we simply couldn't get the right men. I nearly wore myself out on that job trying to get the work along as it should be with the help I had. Why, I would quit the firm before I would undertake a job like that again."

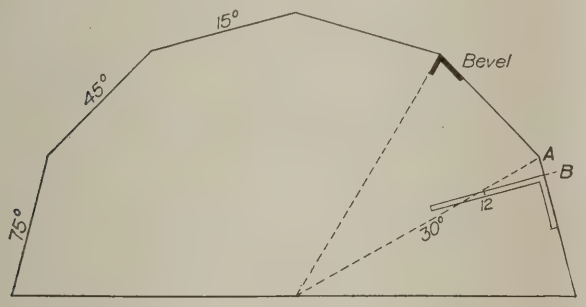


Fig. 1—Outline of One-half of Roof

The above statement is not an exaggeration, but a truthful instance, and the reasons are frequent causes of loss to the employer.

So it is to the interest of every building contractor to treat a good man right. Of course there are off days in every man's disposition, but there are little favors, or acts of courtesy the employer can show his men which will help in their estimation of him. In fact, to make the men feel there is a stronger friendship than just a dollars-and-cents proposition ought to be the employer's strong trump card.

The American journeyman carpenter to-day is as good a mechanic as in any country—perhaps better—yet we have not reached the highest pinnacle of efficiency. It is to our advantage to cut out the unnecessary luxuries, and get right down to the essential elements of the trade, concentrating thoughts and energies more to a line of study in bettering our work, urging the trade unions for a closer standardization in the men so that a man capable of earning a certain fixed wage according to quality and quantity of work should receive it, while a better mechanic should receive a better wage schedule. In this way of grading, each workman draws pay for what he can actually do, and it would help to bring about a more friendly relation between employer and employed.

About the time gambrel roofs for barns came into style, there were several different methods in current use of framing them, and there are now for that matter. Most every carpenter has his own way of doing the work—in using the square for cutting rafters, etc. However, the outcome of these different methods is the same and it is no trouble for a carpenter to frame one of these roofs. There was one shape of roof used long ago that was much in vogue, but of late years not so frequently, as it is a little different from the general style. It is not a true octagon or 60 deg.-30 deg. pitch, but a dodecagon—a twelve-sided figure—and contains three sets of rafters instead of the usual two. Barn structure was generally built of heavy timbers with purlins, posts, plates and beams well braced throughout.

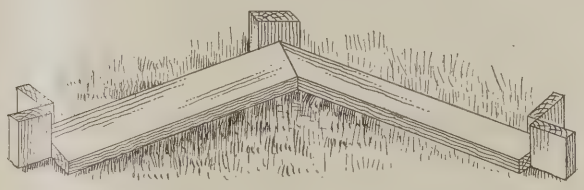


Fig. 2—Rafters for an Octagon-Shaped Roof



Fig. 3—An Improvised Pike Pole

In Fig. 1 is a sketch of one of these roofs showing one way of setting bevels and applying the steel square to obtain the figures by which to cut the miter. Now applying the square to the run and bisecting lines until one foot touches the bisecting line, and measuring the distance from the point *A* to *B* on the square will give the figures to use to cut the rafters which are 12 and 3 7/32 in. on the square. This cut on all the rafters is the same and all the rafters are reversible and is

simply an equalizer joint in the run of the rafters. The same figures taken on the square give the seat and plumb cuts of the top rafters. Should they be used for common rafters on a square-cornered building, also should they be set in a perfectly flat plane, they would form the plate of a dodecagon, while the 30-deg. bisecting line would be the position of the rafters with jacks cut between for a dodecagon shaped roof.

Referring to Fig. 2 which is a perspective view of two of the rafters for an octagon-shaped roof five stakes are driven firmly into the ground, one as shown in the center of the sketch and two at each of the ends, thus making a "form" to hold the pattern as it may be called. While the octagon shape of roof is indicated, the "form" also answers for the dodecagon except that the latter requires one more rafter and stake. The figures to use on the square are 5 and 12, marking on the 5 in. side for cuts on gambrel roof. The same figures on the steel square are also to be used for the common rafters on a square cornered building.

Where the rise is 5 in. and the run is 12 in. the 5-in. mark on the side gives the plumb cut and 12 in. the seat cut.

In doing the work all the rafters should be placed in the "form" and should conform to the pattern. Braces—some call them patches—should be nailed on, then taken out and laid aside until ready for raising. It is a good method to omit the top brace until just before raising, for if short of help the rafters can be easier carried from the ground to the platform.

In the absence of regular ice pike poles, cut a hard-wood sapling, drive a spike in one end as in Fig. 3, which will answer the purpose in raising.

New Publications

How to Make Concrete Garden Furniture and Accessories. Edited by John T. Fallon. 105 pages, sizes 7½ x 10¼ in. Illustrated. Bound in cloth. Published by Robert M. McBride & Co. Price $1.50. Postage 10c.

This book is of special interest to the man concerned with concrete, as it points out in clear, concise language the things it is necessary for him to know for the successful construction of various kinds of garden furniture made of the material in question. Half-tone illustrations picture some of the excellent results which may be gained. Line cuts show "forms" and methods of construction. Details of surface finishings, reinforcements, placing concrete under water, making forms, etc., are dealt with.

Storage Batteries Simplified. By Victor W. Page, M. S. A. E. 208 pages, size 5 x 7½. Illustrated. Bound in cloth. Published by the Norman W. Henley Publishing Company. Price $1.50.

The subject of storage batteries is one which is receiving increasing attention in connection with modern engineering and mechanical work. The book under review aims to present in easily understandable, non-technical language, the basic principles of storage battery action as well as their practical industrial applications, and presents valuable information concerning this subject. Storage batteries are applicable to isolated lighting plants, factory trucks, electric and gasoline automobiles, etc. Topics treated in this book include storage battery development; types of storage batteries; the Edison cell; storage battery construction; various kinds of plates; commercial battery designs; charging methods; converters; Rheostats; rules for charging; battery repairs and maintenance; industrial application of storage batteries, etc. There is also a glossary of storage battery terms.

Practical Homes. Size, 8 x 10¾ in. Illustrated. Bound in board covers. Published by the Complete Building Show Company. Price $1.00.

One of the features which attracted widespread attention at the recent National Complete Building Exposition, held in New York City, was the drawings which had been submitted in the contest for a house actually built in the last two years for less than $5,500. The book under review contains the plans, perspective drawings and occasional details of thirty of the designs submitted, including the prize winners and those deemed worthy of honorable mention. In connection with each house, the locality in which the dwelling was constructed and the total cost are given, thus affording the builder valuable data on varying costs in different localities. The designs include colonial, bungalow, English and other types of houses.

Work is about being commenced upon a building operation which will involve the erection of forty brick houses containing four rooms each and forty brick houses containing six rooms and bath, also six larger houses containing all the latest improvements for the purpose of providing accommodations for employees of the Ebensburg Coal Company, Johnstown, Pa. The general contract has been awarded to Sauers & Moore of Milton, Pa., and subcontracted to Miller & Rider of Altoona, Pa. The statement is made that the contract will require nearly two million bricks and will involve the construction of 24,000 perches of masonry. The job is said to be one of the largest in the building line ever undertaken in the west central district of the State.

SCHOOLS OF ARCHITECTURE

The eleven schools of architecture in the United States, according to the report of the A. I. A. committee on education, are: University of California, Carnegie Institute of Technology, Columbia University, Cornell University, Harvard University, University of Illinois, University of Michigan, University of Pensylvania, Syracuse University, Massachusetts Institute of Technology, and Washington University of St. Louis.

BRIEF REVIEW OF THE BUILDING SITUATION

FIGURES SHOWING BUILDING ACTIVITIES IN VARIOUS SECTIONS OF THE COUNTRY IN JUNE, 1917, AND JUNE, 1916

AS gleaned from reports received from 121 cities of the country the value of building permits issued in June shows a falling off of 33.21 per cent as compared with June of last year. Of the cities reporting, twenty-eight show increased activity in building operations. It is well to note that June, 1916, showed a gain of 30.3 per cent over the same period of 1915, thus rendering the falling off this year less significant than first thought might indicate.

In the eastern section of the country, thirty-four out of forty-seven cities report a loss of 38.55 per cent for June, as compared with June, 1916, the heavy shrinkage of about $16,000,000 reported from the Borough of Manhattan, New York City, contributing largely to the unfavorable situation in the East. It will be remembered, however, that June, 1916, saw a large artificial activity in this borough, owing to the anxiety of intending builders to file plans before the passage of the zoning law. Cities showing an increase include Harrisburg, Hartford, Brooklyn, Pittsburgh, and Utica.

CITIES IN EASTERN STATES

	June, 1917	June, 1916
Albany	$173,615	$307,455
Allentown	65,870	165,730
Altoona	19,997	45,578
Atlantic City	67,646	154,821
Auburn	147,990	159,235
Bayonne	228,470	102,594
Binghamton	76,997	175,123
Boston and suburbs	4,608,000	5,634,000
Bridgeport	744,915	523,300
Brockton	174,710	256,905
Buffalo	1,344,000	1,691,000
East Orange	118,405	112,398
Elizabeth	104,088	250,464
Erie	511,215	353,989
Harrisburg	792,805	126,155
Hartford	1,330,002	814,703
Hoboken	10,493	16,480
Holyoke	133,025	146,250
Irvington	19,760	68,640
Lawrence	50,005	127,100
Newark	1,210,817	1,307,541
New Bedford	478,075	210,925
New Haven	220,475	257,580
New York:		
Manhattan	2,185,353	18,322,110
Bronx	608,458	2,322,278
Brooklyn	7,855,466	4,102,609
Queens	1,293,660	1,474,843
Richmond	254,178	523,362
Niagara Falls	149,136	234,102
Passaic	140,350	163,520
Paterson	127,147	120,914
Philadelphia	2,328,755	5,147,115
Pittsburgh	976,259	940,762
Portland	69,260	130,155
Quincy	157,913	266,589
Reading	104,500	69,750
Rochester	560,032	672,042
Salem	17,303	283,300
Schenectady	139,016	118,493
Scranton	137,290	231,386
Springfield	424,125	898,918
Syracuse	310,993	553,495
Trenton	71,017	286,249
Troy	50,400	55,753
Utica	133,820	129,725
Wilkes-Barre	35,346	117,351
Worcester	478,857	660,152

The middle section of the country shows a loss of 33.39 per cent, there being 40 cities reporting. The most notable decreases are in Chicago, Detroit, Grand Rapids, and other large cities. Increased activity is reported in Cleveland, South Bend, Topeka, and Youngstown.

CITIES IN MIDDLE STATES

	June, 1917	June, 1916
Akron	$914,970	$1,323,455
Canton	160,335	343,445
Cedar Rapids	114,000	237,000
Chicago	4,630,400	11,050,700
Cincinnati	658,940	1,082,580
Cleveland	2,848,550	2,742,570
Columbus	469,510	557,370
Davenport	66,775	115,572
Dayton	273,719	340,913
Decatur	95,000	125,000
Des Moines	161,893	204,220
Detroit	3,683,315	4,936,210
Dubuque	22,000	45,134
Duluth	319,072	420,573
East St. Louis	33,380	68,635
Evansville	64,478	115,452
Ft. Wayne	113,400	335,575
Grand Rapids	174,558	460,153
Indianapolis	720,705	779,792
Kansas City, Kans.	649,300	117,547
Kansas City, Mo.	623,630	974,425
Lincoln	50,305	144,935
Milwaukee	489,953	929,336
Minneapolis	756,300	1,686,835
Omaha	624,830	604,900
Peoria	173,430	116,625
Saginaw	46,880	34,950
St. Joseph	73,016	35,310
St. Louis	910,994	1,215,520
St. Paul	687,429	1,206,075
Sioux City	265,275	526,250
South Bend	208,502	66,721
Springfield, Ill.	46,725	95,135
Superior	64,940	187,120
Terre Haute	29,420	74,615
Toledo	534,523	595,104
Topeka	70,840	37,625
Wichita, Kan.	242,470	194,685
Windsor	138,035	196,545
Youngstown	835,675	279,025

The southern section of the country is the only one reporting a gain, the percentage of increase being 0.85 per cent, seventeen cities reporting. Cities showing gains include Atlanta, Huntington, Oklahoma City, and Washington.

CITIES IN SOUTHERN STATES

	June, 1917	June, 1916
Atlanta	$673,557	$252,776
Baltimore	380,436	541,791
Birmingham	79,504	179,560
Chattanooga	49,738	58,645
Dallas	300,365	311,440
Ft. Worth	133,262	87,138
Huntington	333,084	76,451
Louisville	142,600	260,490
Memphis	161,090	320,640
New Orleans	213,281	614,932
Norfolk, Va.	204,400	245,324
Oklahoma City	249,265	113,675
Richmond	213,659	359,036
Savannah	32,990	97,050
Tampa	30,897	64,330
Washington	1,835,198	1,304,363
Wilmington	129,503	231,575

The western section of the country shows a loss of 15.8 per cent, with seventeen cities reporting.

CITIES IN EXTREME WESTERN STATES

	June, 1917	June, 1916
Berkeley, Cal.	$135,500	$254,475
Colorado Springs	21,895	16,583
Denver	220,400	370,250
Fresno	94,707	96,616
Los Angeles	969,742	1,037,332
Oakland	362,382	423,193
Pasadena	45,207	103,064
Pueblo	33,490	14,275
Sacramento	86,543	303,012
Salt Lake City	214,635	219,650
San Diego	28,536	98,725
San Francisco	1,796,613	2,046,756
San Jose	13,494	77,086
Seattle	371,260	447,390
Spokane	393,770	138,415
Stockton	71,216	60,800
Tacoma	118,555	204,617

CURRENT NEWS OF BUILDERS' EXCHANGES

VARIOUS HAPPENINGS OF SPECIAL INTEREST TO MEMBERS OF EXCHANGES THROUGHOUT THE COUNTRY

"Outing" of Cleveland Builders' Exchange

THE most successful outing ever held by the Builders' Exchange of Cleveland was the seventeenth annual affair of this kind conducted on Thursday, June 28. Members of the Exchange and their families made an automobile trip to the celebrated Anna Dean Farm owned by Hon. O. C. Barber and located near Barberton, Ohio. Although the morning was very unfavorable on account of a heavy thunder shower, machines to the number of 115 left the city early in the morning, arriving in Akron at 11.30 o'clock, where luncheon was provided at the Portage Hotel. All the available accommodations, including the main dining room, the private dining room and the grill, were occupied by the builders, and it was necessary to have a second seating, the total attendance numbering about 480 persons.

Proceeding to the farm after the luncheon, the party was greeted by Mr. Barber on the terrace in front of his mansion where a panoramic photograph was taken. An inspection of the farm, including visits to the stables of blooded cattle and horses and to the green houses covering twenty-five acres, was made. During this inspection several special features and exhibits were presented for the entertainment of the visitors. An unbroken field of 500 acres of growing corn and another field of 125 acres of alfalfa indicated the extent of the farm which covers in all more than 7000 acres under the highest standard of cultivation.

The inspection was followed by a social meeting on the grounds surrounding the residence, during which refreshments were served. Mr. Barber then conducted individual members of the exchange and their ladies through the mansion where many costly paintings and rare pieces of furniture and other objects of interest were viewed. The return to Cleveland was marred somewhat by a downpour of rain, but the outing was greatly enjoyed by the unusually large crowd.

New Secretary of Detroit Builders' Exchange

William W. Norton has been elected secretary of the Builders' and Traders' Exchange of Detroit, Mich., effective from July 1. He succeeds Charles A. Bowen, who became secretary of the National Lumber Dealers' Association on Feb. 1, but who has continued his connection with the Detroit Exchange in an advisory capacity, although resigning as active secretary. Mr. Norton has been associated with the Exchange as the Assistant Secretary for several years.

More than 500 members of the Exchange and their friends recently made a trip to Pashmoo Park, where they thoroughly enjoyed themselves. Many souveniers were distributed during this trip and 500 small balloons were tossed about, advertising the Permanent Building Exposition of the Exchange.

A Builders' Exchange at Augusta, Ga.

Leading contracting builders in Augusta, Ga., have recently perfected an organization in the shape of a Builders' Exchange with officers for the ensuing year as follows:

President.....J. T. Lawrence
Vice-President.....L. E. Palmer
Treasurer.....L. M. Whaley
Secretary.....C. H. Van Ormer

The Exchange starts off with a membership of about fifty, but this number is expected to be rapidly augmented. The headquarters are in the Harrison Building and the idea is to promote friendly relations between all branches of the building trade.

Notes of the Philadelphia Builders' Exchange

In order to show their appreciation of the personal services rendered during his twelve years as secretary, the members of the Philadelphia Master Builders' Exchange presented Charles Elmer Smith, with a handsome watch and chain.

The by-laws of the Exchange have been so amended that the Arbitration Committee could consist of practically the entire membership of the Exchange at the option of the president, the former by-laws limiting this committee to fifteen members.

The last few years have shown a great increase in the adoption of motor trucks by members of the Builders' Exchange.

In a recent issue of the Bulletin of the Exchange appeared an interesting article by H. Colin Campbell, director of the Editorial Bureau of the Portland Cement Association, dealing with the subject of concrete and suggesting that poor results from its use are not always due to inferior cement. He points out that almost invariably the sand, pebbles or broken stones used in concrete mixtures might be better. The keynote of the whole article is "Don't Blame the Cement."

New Officers of Atlanta Builders' Exchange

At the recent annual meeting of the Builders' Exchange of Atlanta, Ga., the following officials were elected for the ensuing year:

President.....P. C. Gilham
First Vice-President.....A. A. Craig
Second Vice-President.....D. A. Farrell
Treasurer.....R. M. Walker
Secretary.....Dan Carey

There was also elected a Board of Directors embracing ten members of the Exchange.

New Builders' Exchange at Mansfield, Ohio

A Builders' Exchange has recently been organized at Mansfield, Ohio, with a membership of 55, and the following officers were elected:

President.....J. C. Kemble
Vice-president.....V. B. Brown
Secretary.....V. D. Wolf
Treasurer.....Clarence Small

An excellent dinner was served at this meeting and an entertaining address was delivered by H. S. Gaines of Columbus, who is assistant to the president of the Ohio Builders' Supply Association. The Exchange, in line with the concerted action of other builders, forwarded a protest to Washington against the then existing embargo on dressed stone, sand and gravel.

Construction Begun on Minneapolis Exchange Building

Active operations in connection with the twelve-story building, which is being constructed for the Builders' and Traders' Exchange of Minneapolis, Minn., were commenced June 11. The contracting builder is the H. N. Leighton Company and it is hoped that the building will be completed this fall.

At a late meeting of leading builders in Miami, Fla., a Builders' Exchange was organized upon the general plan of the one in Atlanta, Ga.

BUILDING AGE

THE DEALER'S DEPARTMENT

THE UNIT PLAN OF ASSOCIATION WORK

ORIGIN OF MOVEMENT FOR DISTRICT MEETINGS IN RETAIL LUMBER TRADE AND VALUE OF LOCAL ORGANIZATION

By Dr. Paul S. Collier*

"NO, I tell you Jim Blake is one of the meanest pups that ever sold a board," ejaculated Tom Jenks, jerking his thumb in the direction of a small gray office building across the street, which bore the sign "Lumber and Coal." "I've been in the lumber business here for fifteen years and in all that time I've never been in his place nor he in mine. Why should I? He continually cuts the life out of the trade, selling at cost or below. To make up for that he skimps the grades. He soaks one customer good and proper and gives the stuff away when he has to. With bricks and coal it's just the same. And I've got to get back at him when I can. Try to be decent! What's the use?"

That was the opinion of competition some time since voiced by a building material dealer in Blankville, one of the average small towns of New York State. In all essential respects this town is no different from scores of others with which we are familiar. There is the usual street lined with stores and on the outskirts we see the residences of substantial citizens. There is a school, several attractive churches, and two lumber yards handling coal, cement and other building material in addition to lumber.

Competing to Create New Business

For years these dealers have existed side by side and for years they have competed with each other for the trade of that town. But one day Jim Blake received a notice inviting him to attend a convention of his State Association. He went. He met live dealers from every section of the State who lived and did business in towns much like his. He heard them discuss cost-reducing methods, service ideas, and co-operation. He found to his surprise that men coming from the same town were friends and that by means of advertising and service helps they were competing more to create new business than with each other.

He thought it over and went back home resolved to carry to Tom Jenks and the dealers in the other towns of his locality a new idea of competition. The result was that before long there was a dinner in one of the neighboring towns to which all of the dealers of the county were invited. They came, and immediately the leaven of co-operation and better business methods began to work. They rubbed elbows, got acquainted, exchanged experiences, and before they knew it began to realize that the "other fellow" was really a good sport despite the fact that he lived in the same town and sold boards.

Origin of the Movement for District Meetings

Such, in brief, is the origin of the movement for district meetings and district organization in the retail lumber trade as sketched from real life. Realizing the benefits to be derived from local contact, the Retail Lumber Dealers' Association of the State of New York, upon the suggestion of Roscoe C. Briggs of Oneonta, now its president, has adopted a definite policy to foster and encourage local meetings and local organization. In carrying out this policy consideration is given both to the geographical layout and to competitive conditions. Each district is being mapped out into sections which will be organized as the work develops. At the first dinner a committee headed by a chairman is usually appointed, which is responsible for making arrangements for the next meeting. The frequency with which meetings are held varies from once a month to once in three months, depending upon the wishes of those concerned. Other officers are frequently appointed and a name adopted. By keeping in close

*Secretary, The Retail Lumber Dealers' Association of the State of New York.

touch with the officials of the State Association the local chairman or president can secure assistance in making the meetings helpful and instructive.

That the value of local organization is recognized is demonstrated by the headway it has already gained in New York State. For years the dealers of Oneida and Herkimer counties have been holding periodic gatherings for the discussion of trade subjects and the cultivation of a fraternal spirit. The Building Material Men's Association of Westchester County and the Shingle Club of Yates and Ontario counties are examples of such co-operation. Within the past month two district organizations have been formed with the assistance of the State Association, and others are to follow.

Purpose is Not to Fix Prices

One thought which is still apt to occur to the ordinary layman is that the purpose of such organizations is to fix prices. Of course this is not the case. To be sure the elements of cost and factors affecting prices are discussed vigorously, and as a result of such discussion, opinions are expressed by individuals as to what certain lines should be sold for. But that is far remote from the old days of price-fixing. How to conduct business at a fair profit, how to create new business, and how to serve the public, these are the three fundamentals which are being most seriously considered wherever dealers get together. Illustrating the scope of the subjects taken up at these meetings is the discussion on the distinction between kinds of yellow pine recently given by Russell T. Gheen, manager of the Trade Extension Department of the Southern Pine Association before the Orange County Lumber Dealers' Association. By bringing in expert talent to advise with them from time to time, men brush away the cobwebs of custom and get a fresh vision of constructive activity.

Keeping the Dealer Posted

An important function performed by this system of district meetings is keeping the dealer posted concerning the activities of the State Association. So far as possible the president or secretary attends the meetings held in the several parts of the State. In this way the benefits of the service departments of the association are brought home to the individual member in a personal way. True it is that he regularly receives "The Lumber Co-operator," which is devoted to association activities, but there is nothing like personal contact to strengthen the membership work of any organization. Needless to say, the combination of the printed page and the spoken word is much more effective than either separately.

Possibilities of the Work

The possibilities of district organization work are limited only by the vision and the persistence of those who undertake the task. The local association can never take the place of the state association; it should be tributary to it. The district meeting can never take the place of the annual state convention; it should be a source of inspiration for it. In it problems will be uncovered and analyzed which later in the wider arena will be solved by the collective thinking of many minds. The state-wide association will then serve as a chain to bind together the unit links, the varying interests of dealers in different sections.

The annual state convention will systematically sift the best thought of the trade and make it available for all. Perhaps in time the same principle of organization will be carried into national activities so the dealer in small town and large city alike may stand shoulder to shoulder on all questions of common interest.

THE "FOREST REGIMENT"

The roster of the commissioned officers in the "Forest Regiment" has just been announced, and includes fifteen foresters from the U. S. Forest Service and two from the Forest Branch of British Columbia, together with one lumberman from the Indian Forest Service and thirteen foresters and lumberman taken from private or institutional work. These, of course, are in addition to the regular army officers. The regiment will convert available timber behind the battle lines in France into trench timbers, railroad ties, bridge timbers, lumber mine props, and cordwood needed in the military operations of the British army. The work may, it is stated, fall within the danger zone and will be done largely in sprout forest of oak, beech, and other hardwood with some stands of pine. The operations will be similar to portable sawmill logging and tie cutting in Massachusetts, Connecticut, Maryland and Virginia.

"HOARDING INVITES DISASTER"

A paper on "The Relation of Publicity and Advertising to National Prosperity," by Louis W. Hill, chairman of the Great Northern Railway, was read before the convention of the Associated Advertising Clubs of the World in St. Louis. Mr. Hill wrote, in part:

"Sane economy and elimination of waste are always wise. But stinting, hoarding—the paralysis of business, mean simply inviting catastrophe; without the slightest reason except ungrounded fear. This surely is a time for the suppression of the calamity howler. The country's all right.

"Right now America needs strength—activity—enterprise—stick-to-it-iveness, more than ever before in its history. The prosperous nation is the strong nation. Reduce the nation's resources—throw an army of bread winners out of employment—and you not only sap America's vitality, but you work a positive injury to the individual. Success is and always will be reciprocal."

According to the annual report of Fire Commissioner Robert Adamson for 1916 there were 312 fewer fires in buildings in New York City than in 1915, and this in spite of 10,000 new structures and the fire hazard vastly increased by the war.

MERCHANDISING LUMBER THEN AND NOW

BUILDING MATERIALS IN EARLY DAYS — MANUFACTURERS AND RETAILERS THE TWO GREAT FACTORS NOW

By L. R. Putman*

THE statement has often been made that there are more good men and fine fellows and less real merchants engaged in the lumber and building material business than any other of the mercantile pursuits. Of course, there are exceptions to any rule, but taken as a whole this statement bears more or less of merit. There is always a reason for any condition and no such broad statement as this should be allowed to go unchallenged.

Necessity is not only the "Mother of Invention," but also of effort. As a rule all men are lazy. Take the big stout fellow who walks into your store or office. Nine times out of ten the first thing he does is to find something to lean against or sit down on. A double strength glass makes a very poor top for a showcase, because some good customer is continually ramming his elbow through it as he hangs the upper half of his tired anatomy on that fragile resting place, usually with his chin in his hands. Without careful military training, there isn't one man in a hundred who can, or will, stand erect on both feet and allow his hands to hang at his sides.

The upstairs rooms in any business house always rent for less money than the ground floor, because it has been found that customers will not unnecessarily exert themselves. Even one step in front of the door has been known to cause the loss of a large amount of business in some of the great department stores.

Lumber is Now "Sold

Now, it has only been in recent years that lumber has been sold. Previous to that time, with a few exceptions, lumber has been bought. Except by a merchant who has faced real competition, not only in goods similar to those he was selling, but in goods of a different nature and which were to be substituted for his, this distinction between selling goods and allowing them to be bought may not be thoroughly appreciated.

With the exception of building materials, most merchandise is either perishable and deteriorates rapidly when kept in stock, or is seasonable and must be sold during a certain period or carried over to the same period of the next year. Then the styles in a great many goods change rapidly, so that valuable goods to-day may be practically worthless three months hence. These fundamental reasons have made it necessary for merchants to exert themselves so as to keep their goods from depreciating in value by remaining on their shelves unduly. With but very few exceptions, however, our friends in the building material business find their stocks carry well and are always in season, while the styles run very little risk of becoming antiquated without warning from the public.

In the early history of our country, and I suppose the same is true of every other country, a home was the thing most desired by every citizen. In my opinion, this love of home and the desire and willingness on the part of our people to own one has been the strongest factor in making America the greatest country in the world. On the other hand, she is weak from a military standpoint, because she has never felt the necessity of a strong army and navy.



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VIEW OF THE CLIFF DWELLER'S HOME

When our country was young and our citizens bent upon owning homes, the materials used in constructing them were usually those most easily obtained. Even in these days, when cars are scarce and means of transportation seem limited, we must admit that the service is better than could have been dreamed of by our ancestors, who had to depend on their own backs and a few Indian ponies for delivering logs, stone, sod and such other building materials as they were able to command.

*Mr. Putman was formerly engaged in the retail lumber business at Fayetteville, Ark., and was advertising counsel of the Southwestern Lumbermen's Association. He is now advertising manager of the Southern Pine Association.

If a man lived among the mountains where caves and stone were plentiful, he turned these into homes and lived in what was to his mind ease and comfort. If his tastes took him to the prairies, he found what to you and me might seem an absolute lack of building materials, but not so with these early settlers. They set about to build themselves homes consistent with the climate and surroundings. They didn't kick about high freight rates or shortage of cars, but went to work with such materials as were in sight and soon had sod houses, which without shade trees were fairly cool, and last, but not least, were practically immune to the ever-appearing cyclones which abound in the open prairie countries. Those of our forefathers who were attracted to the lands of the forests selected the trees best suited to the purpose and built the homes from which have come some of our greatest citizens.



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BIRTHPLACE OF ABRAHAM LINCOLN

And so in those early days the matter of building material caused much less worry and apprehension than did the beasts of the mountains, the plains and the woods, which we so carefully protect in our expensive zoos for the entertainment and instruction of our children. The building of a home was even second in importance, so far as causing sleepless nights for our good old grandfathers, to the Indians, whose interests we have so well protected as to make them the richest people on our continent.

As these natural building materials became scarce, or as our tastes and requirements became more complex, the matter of home-building has become a more complicated undertaking than in former years. Nowadays a man in the mountains may want a wooden house, although he must go thousands of miles for his materials. It is no uncommon sight to see a stone house in a prairie land, or in the midst of a land surrounded by forests. As a general rule, however, the most accessible building materials are the most commonly used in any country.

Natural Materials More Desired Than Substitutes

As a whole, the human race despises sham and deception, and therefore, even to-day, the natural building materials are much more desired than substitutes or imitations. As these natural sources of supply of building materials become exhausted, it is necessary to go further to a market or find substitutes to take their places. In the early days the manufacturer of building materials supplied his customers, who were also his neighbors, direct without the aid of salesmen or agents. To-day the manufacturer may be thousands of miles from the ultimate consumer of his goods. As the tastes and requirements of the consuming public have changed, so also have the customs and conditions. When a new material is introduced, it requires salesmanship to overcome the natural demand for the old. It is in the distribution of these modern materials that better merchandising has developed in the building material business. Up until recently the manufacturers of lumber made no attempt to find buyers for their product, but simply purchased timber, erected a sawmill and placed their lumber upon an already active market. The retailer in turn bought the lumber and allowed the consumers to come and get it from him.

Prices of Lumber Increase

As timber became scarce, the expense of sawing greater and freight rates higher, the price of lumber naturally increased. This made it possible for the manufacturers of substitutes for lumber to open active competition with it. The retail lumber dealer who had already established himself in the building material business was the best possible agent for the distribution of new materials as they were introduced. Being familiar with wood construction, and, as before stated, with a natural demand for his stock on hand, he was slow to increase his investment by duplicating his stock with substitutes. It was the necessity of overcoming this negative desire on the part of the dealers which caused the manufacturers to resort to modern methods of advertising and selling their goods. These methods as they have been introduced into the building material fields have been taken up by the successful dealers in conducting their own business. It is for the discussion of these modern methods of conducting a successful building material business that this series of articles is being produced.

Transportation An Important Factor

Building materials are by their nature heavy and bulky, and therefore transportation enters into the building material business to a greater extent than in any other field of merchandising. For this reason a lumber yard is rarely found except in a town situated on a line of railroad. For this same reason it is the custom, and usually a good one, that lumber yards are located as nearly as possible to a con-

venient sidetrack. Here again, however, the human element must be considered. Customers consider their own convenience before they consider the convenience of those from whom they buy. It is therefore sometimes better judgment to locate a lumber yard convenient for the trade, even at the expense of a longer haul from the car.

The Public View

The public doesn't always take the same view as an old farmer who built his corncrib a half mile from his pig pen. One day as he was out feeding the hogs a neighbor passing by stopped the old farmer as he went laboring down the road under a two-bushel basket of corn.

"John," said the neighbor, "why didn't you build your corncrib closer to your pig pen, so you could save a lot of time feeding the hogs?"

"Oh, pshaw, Henry, time ain't nothin' to a hog," said old John, as he eased the basket of corn down on a corner of the rail fence and raked the sweat from his forehead with his forefinger.

Home Builder Had Trees of His Own

During the time when the sawmill man sold his product direct to his neighbor, the home-builder, it was right often the case that the home-builder had trees of his own and he cut them down, hauled them to the sawmill and carted the rough boards home on his own wagon. Nowadays the home-owner may never see or know the man who supplies the lumber for his buildings. He may deal altogether through an architect, who draws plans to suit the taste of the owner, lets the contract, supervises the construction and turns the building over to the owner complete and ready for occupancy. This is especially true in the larger cities. In that case the location of the lumber yard is decided more with a view to economy in drayage than convenience to visitors. The profits of a large city building material business depend more upon the volume of business and the low cost of handling it than upon the attractiveness of the plant and its access to the public, although there is never a time when these points are not worth considering. It is also true that in the large centers merchants specialize on the different lines of building materials. In the modern city we find a man who sells nothing but lumber, another sells sash and doors and generally glass, another cement and sand, still another finds it profitable to stick to paints, oils and varnishes, and so on down the line, while out through the country in the smaller towns a lumber yard has come to be a department store of building materials, and the stocks consist of everything used in building or repairing.

Unknown Lumber Merchants

There is a class of lumber merchants situated on large bodies of water who are uncommon and practically unknown to the lumber world in general. These are the wholesale lumber merchants along the Great Lakes and the Atlantic coast.

These wholesale lumbermen deal wholly in lumber and carry large stocks. Their supply reaches them by water. The unit is measured by ship cargo rather than by carload. These concerns are wholesalers in the generally accepted term and are not to be confused with the fellow whose equipment consists of a chair and a desk, and whose stock in trade is his ability to get together such manufacturers and retailers of lumber as are not familiar with market prices and conditions governing their product. As previously mentioned, building materials are heavy and bulky, and for this reason their handling is expensive. Except for the wholesalers, who happen to be connected with the source of supply by navigable water, the storage and rehandling of heavy building materials is out of the question. So that in the lumber and building material business more than in any other the retailer deals direct with the manufacturer.

Manufacturers and Retailers the Two Great Factors

As the manufacturers and retailers are the two great factors in the lumber and building material business, it is in their affairs that the great majority of those interested in the building business are most concerned, and it is the successful handling of the retail branch in particular that we will discuss in the succeeding articles.

IMPRESSIONS OF A BUILDING AGE TRAVELER

FIGURING COSTS AND OVERHEAD AS A BASIS FOR FIXING THE SELLING PRICE

ON the north bank of the Susquehanna, in the southwestern part of Otsego County, New York, one of those little dots used on maps to indicate towns marks the location of Unidilla. This particular dot has been on the map of New York State for years, but more people than knew of it before have become aware of the existence of Unidilla since J. W. Van Colt & Son began the manufacture of silos there some ten years ago.

If you are of the impression that all towns of twelve or fifteen hundred population are about the same, visit Unidilla and be convinced of your error. Wide streets, big old shade trees and beautiful homes with well kept lawns give to Unidilla an air of prosperous contentment which is unusual and decidedly attractive.

J. W. Van Colt & Son not only make the well-known Unidilla silo, but they conduct an extensive

wholesale and retail lumber business also. The retail department serves a rich agricultural section for a radius of ten or twelve miles, which includes a half dozen or more small towns and is under the management of H. D. Arbuckle.

Small Dealer Doing Business in a Big Way

I had heard of Mr. Arbuckle as a man who conducted a lumber business in a small town in a big way and the object of my visit was to find out how he did it. The principal reason is because he thinks big and then works out the necessary detail reducing big ideas into practical results. He knows when, where and how to buy as well as most other things which make for success in a business of this kind; but what impressed me most was his method of figuring costs and overhead as a basis for fixing the selling price.

What "Cost" Means

Cost, to him, means not only the purchase price but every item of expense involved in storing the lumber in sheds or on piles in the retail yard. The expense of unloading and piling is not figured as overhead, but as cost, and every item or car received is charged with the actual expense of handling that particular material and not by average or guess work.

As he expressed it:

"If we get in a car of 2 x 4 hemlock and it takes four men at thirty cents an hour six hours to unload and pile it, I add $7.20 to the cost. Another item which goes into cost is the interest on the capital investment required to carry stock. This varies according to the demand and turnover. For instance, the demand is greater for standard sizes of hemlock than for cypress or white pine. It moves faster, makes a quicker turnover and provides a greater volume of business on the capital investment. Why should the purchasers of hemlock pay the interest on the money tied up in these slow-moving materials? My theory is that each item should carry every expense connected with the purchase, handling, carrying, sale and delivery of that particular item, and no averages are fair either to the customer or to the dealer."

Keeping Track of Expenses

"Yes," I said, "that sounds ideal; but how do you keep track of your expense, turnover, capital investment, interest, etc., on each item? It must make a lot of clerical work."

"No, it does not. And even if it did, the satisfaction and profit of having a check on everything all the time would soon make up for it. I want to know what my men are doing. These time slips each day show just what they did that day and it takes only a few minutes to divide this up and charge the actual time to the different items. When you get right down to it, there aren't so many different items and the moral effect on the men makes their time enough more valuable to pay several times over for keeping the record. Practically the same thing is done in figuring costs in a manufacturing plant. I consider specific costs just as important in merchandising lumber as in making silos or anything else."

"All right; that gets your costs for you; but how," I asked, "do you keep track of the turnover and capital investment in connection with the handling of each item of material?"

Keeping Accurate Stock Records

"From my stock records. I have heard retail dealers say it is impossible to keep accurate stock records, but I wouldn't know how to conduct this business without them. For the past three years the stock records have checked up exactly with the annual inventory and through them I know when and how much to buy and can avoid loading up with dead stock that isn't moving or running out of sizes and materials in demand.

"Every day, before the invoices are sent out, the items are transferred to the credit side of the stock card. Each week these are totaled and deducted. It takes only a few minutes of the bookkeeper's time and saves me an infinite amount of trouble and nervous energy. If he finds the stock getting low when these weekly deductions are made, he calls my attention to it. Or, if a salesman drops in, I don't have to go out into the yard and guess at whether I need anything or not. My stock records show just what is on hand and just how fast it has been moving; so that I can not only tell if I need anything or not, but how *much* I need.

Obtaining Year's Turnover

"From these same records I get my turnover at the end of the year. To illustrate what I said about interest on capital investment in different items, hemlock moves faster than white pine. Say my stock records show that we have had an average of $5,000 worth of hemlock on hand at all times during the year and that our total sales of hemlock amounted to $30,000; the interest on $5,000 at 6 per cent is $300, or 1 per cent of our sales.

"In order to meet the demand for various sizes and grades of white pine, we may have had the same amount, $5,000, invested in that item, with total sales of only $10,000; the interest on the investment is the same, $300, which is 3 per cent on sales, on account of slower turnover.

White Pine vs. Hemlock

"Still another feature to consider: White pine is delivered to the consumer in a more finished condition that is hemlock. It requires more careful handling, smaller load, more trips, more expense for delivery. Hemlock can be delivered for an average of one-half of 1 per cent, while it costs about 2 per cent to deliver white pine. A difference of 2 per cent on interest on capital required and 1½ per cent on delivery; 3½ per cent on these two items alone; who shall pay this—the man who gives us a quick turnover and repeated profits on the money invested in hemlock, or the man for whose accommodation we carry white pine? I don't know how the

other fellows figure, but we ask the man who buys hemlock to pay the actual expense of retailing hemlock, plus a fixed percentage of profit; and the man who buys white pine to pay the expense of detailing white pine plus a fair percentage of profit. We feel that by this method we are treating both customers and ourselves fairly.

Accused of Price Cutting

"I know we have been accused of price cutting, but I think that is because our prices figured on this basis fail to check up with those of the dealer who simply averages everything and works on a uniform margin without taking these specific items into consideration. Of course there are items of overhead such as insurance, management, office expense, etc., which we simply spread over the whole business; but it is so much easier and better to know just where you are, on these items I mention, that I can not see it any other way."

Telling It to Readers of BUILDING AGE

"May I tell the readers of BUILDING AGE what you have said to me in this connection?" I asked.

"Surely, I don't care. Maybe some one will criticise the way I do it and show me a better way."

Mr. Arbuckle, with a courtesy which made Unidilla seem all the more attractive, told me a lot more about how he conducts a retail lumber business in a small town but this is all I'm going to send you just now.

COMMERCIAL WOODS OF THE PHILIPPINES

"The Commercial Woods of the Philippines: Their Preparation and Uses," is the title of Bulletin 14, published by the Philippine Bureau of Forestry. It contains 246 pages, and describes the forests, lumbering conditions, uses, sizes, distribution, mechanical properties, durability, etc., of the island's various woods. It is obtainable from the Director of Forestry, Manila, Philippine Islands, at a cost of $1.00, United States currency.

FINANCING THE LUMBER YARD

SUGGESTIONS WHICH TEND TO SOLVE THE PROBLEM FOR THE LUMBERMAN

BY C. E. DAVIDSON*

THE country is full of retail lumbermen who realize they do not carry stock enough, and who often feel the need of capital to aid them in buying in carload lots, and also, in some instances to aid them in promptly meeting bills, so that their credit may not be impaired.

The writer has in mind a certain lumberman who had $4,000 invested in real estate, about $15,000 in stock. A good season came along and he sold from $5,000 to $8,000 for several months, running his accounts receivable item up to an astonishing sum. He was worried. Had a big business, was making money, was compelled to order more material to keep stock up to meet the trade which was coming his way, etc., but he was woefully short of cash, bills coming due, and getting in deeper.

Consulting His Banker

After a night of restless sleep, he went to his books, made out a perfect statement of his affairs, showing liabilities and assets, and the healthy condition of sales. Took this statement to his banker and laid the whole matter out before him.

The banker asked him if it were possible to collect up closer. He told him it was not: that lumbermen could not exact of their customers cash payments; that the whole amount could not be collected until the building was completed, returns made, etc. In some instances he could get a part payment here and there, by using diplomacy, pleading he was "hard up," which was a personally embarrassing thing for a prosperous merchant to do.

Drawing Up the Note

The lumberman was told his accounts were not negotiable, but that if the accounts could be turned into notes they could be assigned to the bank, the lumberman endorsing them, the bank getting the interest, of course. A note was drawn up which specifically stated that its taking did not waive any lien rights. That clause in any note, in my judgment, will be binding in any state in the union, because all courts will refuse to allow any man to dispute that to which he attaches his name. It is the general law, recognized by the common law practices of what is termed the law of estoppel—putting it plain, he is 'stopped from denying his "own deed."

But to return to the lumberman. Immediately following the statement that the taking of the note did not waive any lien rights, was a clause usually known as a judgment note and a sample note of this kind is printed herewith.

The lumberman then made the following terms: Sixty days' credit, after which settlement to be

*Mr. Davidson operates the Greenville Lumber Co. of Greenville, Ill., and is one of the most influential members of the Illinois Lumber & Builders' Supply Dealers' Association.

made by either cash or note, which run from three to six months. He had no trouble in enforcing these terms. Any customer who desires more accommodation in these days is not a good customer. No customer demanded more. He soon learned that many reputable farmers who learned of the terms would build when they desired to do so, provided they could give note and settle when the crops were harvested or the hogs or other products were sold. The lumberman kept a record of all notes, of course, because he had endorsed them, and with the co-operation of the bank collected up promptly. The bank notified him of a delinquent, and it was immediately looked after, and, if no payment was at once made, a lien was filed as an added protection or suit brought under the judgment clause in the note. Under the judgment note suit can be brought "at any time hereafter," no lien law, like a mortgage, is cumulative, or in addition to the regular processes of collection of accounts. You can take a note and take a lien, too, just as a person takes a note and also a mortgage, or even additional security. A creditor may have as many securities or remedies as he likes, but, of course, only one recovery.

The notes, taken in lieu of accounts, are taken to the bank and deposited just the same as cash or checks. The account of the lumberman is credited accordingly and the lumberman is relieved. He can safely replenish his stock and carry his customers a reasonable time. After this system is established no one would depart from it.

It is true that trade acceptances are used some at this time by wholesalers, but most retailers prefer not to issue them. They are held here and there, and it has a strong tendency to hurt his

LUMBERMAN'S NOTE.

$..... .....191.....

.....*after date, for value received, I promise to pay to*

GOOD LUCK LUMBER COMPANY

or order..... *DOLLARS,*
100

with interest at seven per cent per annum from date until paid.

And it is expressly understood that this note is not taken as payment, but in settlement of account and extension of time for payment, and it is further agreed that the giving of this note shall not operate as a waiver of any lien upon the property improved by the material for which this note is given. And to secure the payment of said amount I hereby authorize, irrevocably, any attorney of any Court of Record to appear for me in such Court, in term time or vacation, at any time hereafter, and confess a judgment without process, in favor of the holder of this Note, for such amount as may appear to be unpaid thereon, together with costs and reasonable dollars attorney's fees, and to waive and release all errors which may intervene in any such proceedings, and to consent to immediate execution upon such judgment, hereby ratifying and confirming all that my said attorney may do by virtue hereof.

.....

P. O...... .....

FAC SIMILE OF PROMISSORY NOTE SUGGESTED BY THE AUTHOR OF THIS ARTICLE

matter if the note provides for a longer time by its terms. This is provided so that the holder, if he feels himself insecure for any reason, removal or otherwise, sale, etc., can at once file his note in court and have an immediate execution issued and without service by an officer. All banks now use this form.

We presume that every state now has an association, and we further presume that its officers, understanding the local provisions of its lien laws, have instructed its members in relation thereto. If it has not been done the association's officers should at once procure the services of an attorney who has had some experience in the lien laws of the state, has read its court's decision construing it, and have him draw up a blank form for the use of the lumbermen. We believe the accompanying form would be applicable in nearly every state. The form here given is used in Illinois. The taking of the note does not affect the lien rights. The credit with the wholesalers, which is a very bad condition to asume. Besides, under the plan just proposed the banker does practically all the collecting. A debtor will pay the bank much quicker than he will the lumberman. No affront is created against the lumberman. People expect the bank to collect up promptly, and desiring to keep their credit good at the bank pay up promptly. The lumberman scarcely ever sees or hears from a note once taken to the bank. Of course no note should be taken, and really no credit sales made to any unless they be land owners against whom a lien will lie. Of course contractors must be credited, but that is a different line of credits, and collections can be enforced against them much better and more promptly.

We give this plan as a suggestion to the retailers who are troubled with a good business, because good business always means heavy accounts and involves additional details.

CO-OPERATION BETWEEN THE DEALER AND THE BUILDING CONTRACTOR

BASIS FOR OBTAINING BIDS—THE COUNTRY LUMBER DEALER VS. THE CITY DEALER

BY "THE OLD RETAILER"

RETAILERS of building materials are closely associated with the trades people who put these materials into use, and this association involves a mutual dependence one upon the other. Therefore, both of these interests should recognize the need for and strive to effect a harmony in their relations. Unfortunately, however, business competition and selfish individualism have established a certain friction between them. And whether or not this will ever become so modified as to allow of co-operation is a problem for the future to solve.

Method of Procedure When About to Build

Under the present system, when a man has made up his mind to erect a building he first consults an architect, whom he employs to formulate a set of plans and specifications. These in turn are submitted for the competitive bids of contractors; but before the contractors can give their bids they must get from the building material men estimates on their bills of items. The contractors know they are bidding against other contractors, and they are perforce obliged to induce the building material men to compete with each other for the sale of materials.

Building Materials Are Bought by the Unit

Now, building materials, lumber in particular, are bought by the unit, figured in a lump sum, from the lowest bidder. The contractor is supposed to figure his percentage of profit on the materials. The architect has his percentage for supervising the job and seeing that the contractor furnishes the specified materials. The building material man receives a profit according to what his competitive instincts or the conditions of the transaction allow. The owner has but little to say or to do about the matter, except to make payments to his architect, and whether or not he receives the benefit of all this competition he is usually satisfied if the total cost comes within the amount he intended to invest.

Division of Profits

It is this division of profits on the material which goes into a building of which the dealer is not in favor, because he considers that the entire profits belong legitimately to him. Then, again, he has to bear more than his share of the increased cost of building, whereas, owing to the system of price competition among dealers, it frequently happens that the contractor and architect together make as large a percentage of profit on the materials as does the dealer. As a rule, too, the building material man virtually carries the contractor until he completes the job. Labor bills have to be paid first of all, and bills for material come afterward. Often several months intervene between the time of delivery of the goods and the time of payment, and of course the interest on the amount involved is just that much additional subtracted from the dealer's profits on the sale.

Financing the Bills

This is, of course, speaking in a general way. There are contractors who have enough capital of their own to enable them to carry their own burdens and to meet their bills promptly. Many, however, depend wholly upon their credit with the material men to carry them through, and not infrequently do they extend this credit to a point where they do injustice to their creditors. There is a tendency among them also to assume the attitude that the dealer is largely dependent upon them for business and that he is therefore under obligation to carry their accounts, which really means furnishing them with the capital with which to do business.

As long as the material man will allow these things in order to influence trade, he can hardly blame the contractor for working his credit and influence to the limit. And the contractor, if he eventually pays his bills, may be credited with good business abilities; for if he, with his small capital, can induce the dealer to contribute to his advantage he is the gainer thereby.

Privileges Often Abused

This position which the contractor occupies is, however, likely to be abused, because there are men in the business who are capable of taking undue advantage of their privileges without regard for the interests of the material man. The latter is therefore forced into the position of competing for the trade of contractors, the owner being a negligible quantity so far as dealing with him is concerned, and is practically dependent upon the contractors for the greater share of his business. He has but little voice in determining the kinds of materials that will go into a building. The architect specifies the kinds and grades of everything, and the contractor is supposed to act in accordance with these specifications. Sometimes, however, he uses his own discretion and

"gets away with it." Many a job has been secured this way, to the loss of competing contractors who have figured on specified materials.

Contractors and Material Men on the Same Basis

There is an agreement between the building trades and material men in Kansas City by which all contractors and building material men are put on the same basis in figuring on a building. All itemized bills of materials are submitted to a committee appointed for the purpose. These estimates are audited and all discrepancies in grades and kinds of materials removed, so that every dealer figures strictly according to specifications. This does away with one of the worst trials of the retail lumberman, for without some such arrangement he never knows whether he is figuring on the same list of items as his competitor is or not.

Take the average building; no two contractors will figure the same quantities of materials, and when there are half a dozen of them figuring on the same job there will be that many different bills of items. This is chiefly due to errors in judgment, but sometimes it is deliberate on the part of a contractor for purposes of underbidding his competitors. An auditing committee such as the one above mentioned is really a protection to the honest and competent contractor against those who are inclined to use illegitimate practices. Besides, it offers every bidder on the materials an even chance. It serves to protect even the owner by giving him what he pays for.

Conditions in Country Districts

All this applies chiefly to conditions prevailing in the larger cities, where the architects and contractors are the principal factors in the building business and the dealers have no voice except their bids on specifications and their attention to the collection of their accounts. In the country districts the relations between the contractor and the dealer are different, but the essentials of buying, selling and collecting for materials sold are practically the same. In the majority of country towns the lumber dealer handles all kinds of building materials that are used in his locality, including even paints and hardware, in many instances. In fact, the modern lumber yard is supposed to be a place where everything in the building material line is handled. And by reason of this the country lumber dealer is called upon to meet a good many building questions from which the city dealer is exempt. Instead of being subordinate to the architect and contractor, he is held to be the chief source of information on building matters. And if he uses any one of the plan book systems which have lately come into use he assumes the position also of architect for the community. Before the coming of the plan book, however, the country dealer was more or less of an advisor in the planning of buildings for customers, making out bills of items for them. This brought him into direct relations with the owners. In a considerable measure this makes him independent of the contractor, so far as selling the materials is concerned, and the more he understands plans and building construction the less is his dependence and that of the community upon the contractor for such knowledge and information.

The Country Dealer vs. the City Dealer

The country lumber dealer, therefore, is progressing while the city dealer is continuing along practically the same old ways of doing things he has employed for some time past. It is a rare thing to find dealers in large cities doing any advertising in the local papers, except perhaps occasionally for the purpose of announcing the location of yards. Many country dealers confine their advertising to this limit, but there is a growing number of them which is recognizing the power and value to business of creative advertising and adopting it as a necessary part of their businesses. All of this, of course, tends to make the dealer less dependent upon the contractor for the securing of business.

The Country Dealer as a Contractor

There are some country dealers, too, who have gone still farther. They contract to sell the building and turn it over to the owner completely finished. In doing this they employ a competent building mechanic as foreman to superintend the details of construction. This man is usually employed on a yearly salary. The other workmen are paid by the day. This course of action is necessarily confined to the smaller towns and would hardly be feasible in a place of any considerable size. It works satisfactorily in the smaller places, because it insures reliable service and gives a good measure of steady employment and good wages to the workers in the building trades. The advantage to the dealer is that he does not have to divide his profits with anyone, and the owner has to pay but the one profit and is sure of a satisfactory job. There is not much danger of the owner paying too great a profit, as competition will keep prices to a reasonable basis.

The Reason for This Step

Those country dealers who have gone into this business of contracting have usually done so because of the unsatisfactory relations existing between them and the local carpenters, who are generally the contractors in these small towns, and competing with each other for every small and large job that comes along. Few of them make more than a fairly comfortable living. Since there is a long, dull season, when there is something to do, each of these contractors tries to see how low he can figure under competitors, and the day workers whom he employs will generally take more of the profits than he does. Consequently, should misfortune befall him in carrying out a job, or should he find that he has not figured enough work or materials to complete it, he has no margin to absorb the difference. Therefore, it is usually the building material men who must

carry him till he has a better "streak of luck," and the lumberman comes in for a large share of the carrying.

In some cases such men are harshly criticized and called dishonest, because they don't pay their bills, while the fact is more a question of incompetency in business matters than intentional dishonesty. But good intentions don't pay lumber accounts nor other obligations. A loss is a loss, whether a customer is honest or dishonest. With the average small-town lumber dealer the honest, capable carpenter-contractor is one of the best friends he has and is an asset in his business, providing the two can work together for their mutual interests. Such a contractor can be of great use to the dealer in the securing of business and in helping him in the disposal of slow-moving stock. Then, too, when he has lumber left over from a building he will use it again and not throw it back on the dealer's hands because it is not in as good condition as when delivered on the job.

There are many carpenters who contract to do the work only. They make out a bill for the owner, who stipulates with the dealer that all the material not used shall be returned. The bill is often intentionally "stuffed" with more than is needed, to enable the carpenter to select the best of it and to have plenty for scaffolding and for other means of expediting his work. What is left over is not taken care of, and the result is that it goes back to the lumber yard in a more or less damaged state, to be wrangled over in the settlement of the account. And no matter what allowance is made for the poor condition in which lumber has been returned the dealer finds it difficult to sell it at a similarly reduced figure.

The country lumber dealer may be said to be dependent upon the contractors and building tradesmen. He is to some extent, but more in the matter of influence than in any other way. For, though he may deal direct with the owner, the influence of these men who work at the different trades is a factor in the getting of business that has to be reckoned with. They are in the same boat with the building material man, and therefore the more harmonious are their relations the better and more profitable is it for both.

In another article we will discuss this subject at greater length, for there are many angles to it.

EXPERIENCES WITH MOTOR TRUCK HAULAGE

FIRST CAUTION OF USERS IS TO CHOOSE DRIVERS CAREFULLY AND ELIMINATE OPERATING TROUBLES

A CANVASS of several hundred contractor-and-dealer subscribers of BUILDING AGE to gather data on their experiences with motor truck haulage has produced an interesting array of practical information and expert opinion. Others in the trades similarly situated who are considering the motor delivery question will, without doubt, find a discussion of the subject, from the user's viewpoint, valuable. All types of truck and sizes ranging from 700-lb. to 3-ton capacity will enter into the discussion. Some cases will be found where one user reports satisfactory service from a given make and size, while another details his difficulties with an identical machine. An effort will be made to sift the troubles to the bottom, for the benefit of all concerned.

Advantages of Motor Truck Delivery

The general sentiment is that motor delivery has given satisfaction and has proved profitable from the standpoint of convenience and time-saving for workmen and machines, as well as economical of operation compared with the upkeep of horse-drawn delivery sufficient to accomplish the same results.

To answer the half-dozen complaints that motor trucks are constantly requiring repairs, there are an equally strong half-dozen testimonials from users, vouching for economical upkeep. The opinion of one satisfied owner of an International ½-ton truck—C. H. Myers of Enid, Okla., a dealer in builders' specialties—suggests a solution for some of the difficulties others have met and classed as deficiencies. Mr. Myers says, "I believe a great deal of the trouble some have is with the man and not the car; any motor vehicle needs attention." It would appear reasonable to assume that a motor truck should be given the same care in operation as any other machine and, indeed, more general supervision, since it is called upon for service under varied loads and changing conditions of weather and road-beds.

The Driver a Big Factor

Other owners agree that the man at the wheel is a big factor in the prevention of accidents and maintenance with as little wear and tear as possible. E. P. Kinney, a contractor of East Lansing, Mich., who uses a Reo ¾-ton truck, says: "I have worn out four trucks, all 1500 lb. capacity, and have learned that most all trouble is caused by careless drivers." Another contractor and builder, Fred Modscheidler of Butte, Mont., owns a Ford machine of the light delivery type, for traveling to and from jobs with light equipment or materials. "As I handle it myself," he says, "I have had little trouble, and my experience has certainly been profitable."

Why One Concern Does Not Use Motor Trucks

The Williams Lumber Company of Leadville, Colo., gives as a reason for not using motor vehicles, that they will not climb steep hills with mining timbers. The Williams company uses four-

horse teams. In controversy with them we might cite again the experience of Mr. Myers. The whole story of his unusual tests of the efficiency of his International truck will be interesting:

"I have used the International truck for about two years and I have found it satisfactory. I can not say that it is better than other makes of truck, because I have used no other make. I am using at present the 1000 lb. capacity. I sometimes haul as much as a ton in it. Considerable of my work is country work, and when I have to drive from five to twenty miles and take men and tools, I often haul as many as seven men and their tools to and from the jobs.

"I drive my truck myself and watch it closely, keeping all parts oiled and watching for loose nuts, etc. For nine months I have used the truck almost every day.

An Unusual Record

"In a day I drove it from here (Enid, Okla.) to Hutchinson, Kan., a distance, the way I had to go, of about 160 miles, and never boiled the water in the radiator. I made another drive to Liberal, Kan., I think a distance of about 275 miles, and made some of the steepest hills that I ever traveled over with any vehicle. If anyone doubts there being hills in Oklahoma, let him try driving straight West from Alva, as I did, about one hundred miles. I had no engine trouble whatever. Of course I had to travel in low gear up some of the steepest hills, but on account of the gas tank being in the front end of the car, it always gets gas to the carbureter. I saw a man trying to get up these hills with a Ford and he had considerable trouble on the steep grades about getting gas to the carbureter.

The Repair Bill

"My repair bill is not as much as my shoeing bill was on a horse that I used before I bought the truck. I use about 8 gal. of gas per week in ordinary duties. I generally have four or five different jobs under construction at a time and use the truck quite a little.

"I believe a great deal of the trouble some have is with the man and not the car; any motor vehicle needs attention.

"I favor the solid tires for a contractor's delivery. I believe there is no better truck made than the International motor truck 1000 lb. capacity for light work and the larger size for heavier hauling."

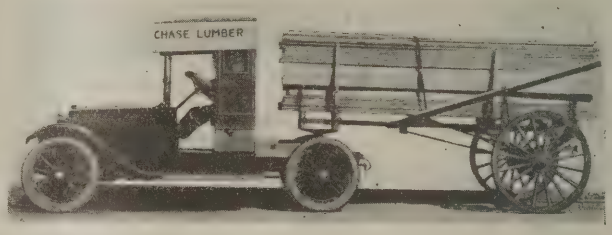
Later articles will go more specifically into questions of types for special purposes, cost of operation, endurance, tires and trailers.

MAKING OLD AUTOS USEFUL AS TRUCKS

Economy of time and labor is as essential to the lumber dealer of to-day as it is to those seeking success in other lines of industry. More and more is the wide-awake dealer being forced to meet competition by seeking new ways and means by which he can give better and more satisfactory service to his customers.

Perhaps one of the most essential features of any business is a prompt and economical delivery system. The customer who has to phone the lumber yard several times and then come down himself to get a rush order is pretty likely to go elsewhere next time; lots of good customers are lost in this way.

The automobile truck is proving itself a decided help in the solving of the delivery problem, for weather, roads, distances, and running time prove it in many ways superior to the horse. Often the smaller dealer in building supplies, although realizing just how much the truck would aid him in keeping his trade, feels somewhat hesitant about making any extensive investment, especially if many of his deliveries are in small lots. An interesting manner by which this problem may be solved was adopted by C. P. Chase & Co., Inc., Springfield, Mass., who took a 1915 Dodge touring car and had it transformed into a tractor by the removal of the tonneau and attaching a cab to the frame for a driver. Then a tractor was attached to a Martin rocking fifth wheel and the result is shown in one of the pictures here presented. It is interesting to note that the load shown on the tractor weighed about 5500 lb.



Another firm, the F. J. Barrett Lumber Company, makes use of the same device, the appearance of the outfit used being shown in the other illustration. The truck is a 2-ton Signal with an 8-ton trailer attached, there being a roll-off on the back.



This method forms an easy and comparatively inexpensive method of converting a light runabout into a vehicle which can easily handle a ton, or to enable heavier cars to handle proportionately larger loads. As there are thousands of old touring cars throughout the country which can easily be so converted at comparatively little expense, it affords the smaller dealer especially an opportunity to increase the efficiency of his delivery service.

Some Suggestions for the Dealer's Homecraft Department

UTILIZING SHORT LENGTH LUMBER

By John Wavrek, Jr.

In the planing mill there is always an accumulation of short pieces of lumber, which presents a serious problem for the poor man when it comes to the question of getting rid of them. Especially it is difficult to use up hardwood short stock, such as oak, chestnut, birch, etc. White pine, cypress and yellow pine can more readily be used up in short pieces in making brackets, rosettes, etc., but these are not very much the vogue at present as they were at one time. Years ago there were numerous brackets and rosettes used on buildings in connection with porches and trim, but the present day styles are not such as to require a great amount of these features; therefore the mill tries to keep down the power of short pieces as much as possible, but in spite of all foresight, these short pieces will pile up and become a source of concern to the mill foreman.

In Figs. 1, 2, 3, 4 and 5 are shown the construction of a book rack or shelving, the design being simple and the lines of such a character that an ordinary carpenter can execute them on his bench and need not have any machines to do the work. Fig. 4 represents an end view of the uprights, which are ¾ x 11½ x 4 ft. 11¼ in. These ends are made up of two pieces ¾ x 5¾ in., and glued in the center, the upper part having an opening cut out which can easily be done with a coping saw. The lower cut should be made before the pieces are joined together.

Having the sides glued and cut they can be dadoed ¼ x ¾ in. for the shelves. This dado must not be run through the whole width, but should be kept about ½ in. from the edges. The top shelf can be made of two pieces also. The other shelves may be made up of several narrow pieces. The dividing portions of the lower part are ½ in. thick, and are dadoed into the bottom and second shelf. This dado should also be stopped ½ in. from the edges. It should be remarked that Fig. 2, which represents the front view, is also the same as the rear view.

This is a piece of furniture which can be used in every home, not only for books, but also for magazines, such as The Building Age, which I keep in a rack of this kind. At the same time it utilizes short lengths of lumber which might not be advantageously used otherwise.

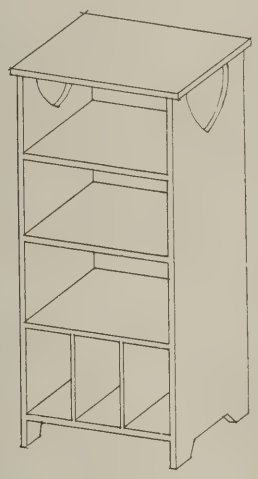


Fig. 1—Perspective View of the Book Shelves

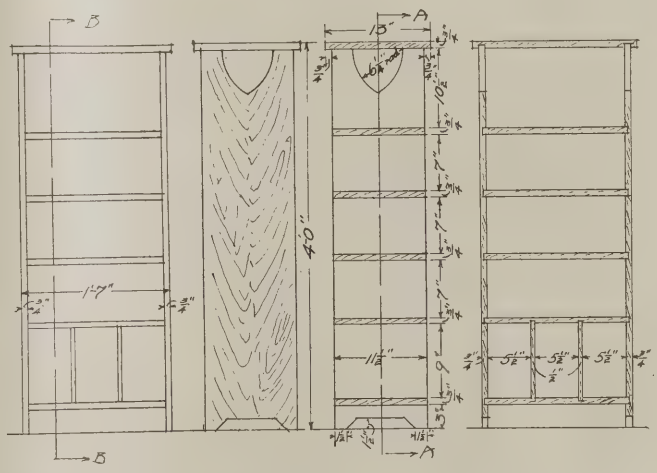


Fig. 2—Front View | Fig. 3—End View | Fig. 4—Section Through B-B | Fig. 5—Section Through A-A

MISCELLANEOUS CONSTRUCTIVE DETAILS OF A CASE OF BOOK SHELVES

No. of pieces required to make Book Shelves.

2 pcs.	¾ x 11½	3-11¼	Ends
1 pc.	¾ x 13	1- 8½	Top surface 4 sides
3 pcs.	¾ x 11½	1- 6	Shelves surface 4 sides
2 pcs.	¾ x 11½	1- 6	Shelves surface 4 sides and dado
2 pcs.	½ x 11½	9½	Partitions s 4 s

A very handy article designed to hold numerous catalogs and books which accumulate in an office is shown in Figs. 6, 7, 8 and 9. The uprights are made of 1¾ x 1¾-in. stock with a tenon at the lower end, which fits into a mortise made into the base and securely fastened thereto by means

of two round-headed screws. These uprights are also dadoed ½ in. deep to receive the shelves, which are fastened thereto by means of a strong round-head screw.

A rack of this kind is of much use in an office by placing it on casters, as it can be shifted to the place most needed without trouble. Being simple in construction, this can easily be constructed by any mechanic of average ability.

In the construction of the rack here shown,

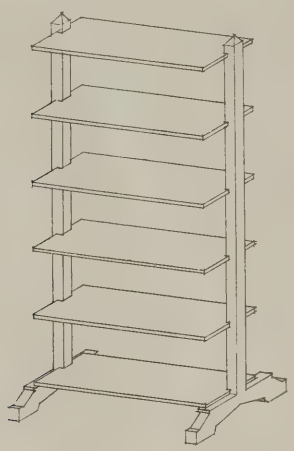


Fig. 6—Perspective View of an Office Rack

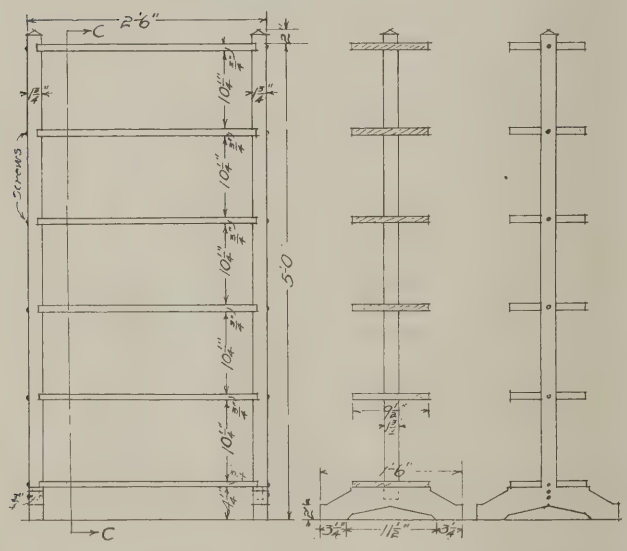


Fig. 7—Front View

Fig. 8—Section Through C-C

Fig. 9—End View

DETAILS OF AN OFFICE RACK

it is possible to use up short pieces of lumber, the shelves being glued up of narrow stock. The sketches plainly show how the work is done.

Pieces required to make Office Rack.

2 pcs.	1¾ x 1¾	5-0	s 4 s
2 pcs.	1¾ x 4¼	1-6	Base
6 pcs.	¾ x 9½	2-3½	Shelves s 4 s

"My profits are largely on paper," remarked the broker.

"Mine are on the slate," chimed in the foxy coal dealer with a wink.—*The Lamb.*

THE DIGNITY OF THE RETAIL LUMBER BUSINESS

By C. E. Davidson

I imagine some, upon reading the heading, may exclaim, as did the old backwoodsman who, upon seeing at a circus a giraffe with its long neck, "Why, Marinda, there haint no such animal." But there is such a thing as the dignity of the retail lumber business. It affords more independence, more freedom, more profit in accordance with effort expended than any business of which I know.

Man is constantly seeking to better his condition, with the ultimate aim of reaching a point in his financial affairs where he can call his time his own, where he shall not be tied down to a roller top desk and a swivel chair; he longingly looks to the day when he can leave the heated precincts of his office with its cares and vexations and seek divertisement fishing, motoring, on the golf links, or, what is better, just loafing around with a sort of a "come day, go day" state of mind.

To do this and yet make a living a man must seek some avocation which will take him as far from the servient class as possible. In a way farming offers independence and much freedom, and the ownership of land has its bright sides, but in a way the farmer must gamble with the weather, and in many instances can't escape severe toil under adverse circumstances. The owner of a lumber yard deals only with the better financed element of his community. His credits are large, but his debtors can afford to pay. Lien laws give him a superior credit system, and his capital is protected. He can, if he wishes, leave almost any time or any day and feel that the yard manager and the boys will keep on making money while he is away.

Under the circumstances he need not be "hour" bound; there is scarcely no time he may not safely leave his business for a few hours or a day or so. I am of course not speaking of the very smallest yard, where only one man is in charge. I am talking of the retail lumber dealer such as we find all over the United States.

Lumber does not go out of style. It is always worth what it cost and a profit added. There are times he makes big money. Retail lumbermen will be universally found to be prominent in their communities, where they can, if they desire, be influential in civic affairs.

Compared with the great majority of businesses the retail lumber business is the superior of any of them.

I am of course referring to up-to-date, live lumbermen—the kind who keep up their stock, collect their bills and pay their debts promptly and attend their associations and take one or more good lumber journals.

Willis: "Just think of it! Those Spanish hidalgos would go three thousand miles on a galleon!"

Gillis: "Nonsense. You can't believe half you read about those foreign cars."—*Exchange.*

AS SEEN BY THE MAN ON THE ROOF

The Hammer

The hammer is a useful thing,
  An instrument of might;
A hammer is for hammering—
  But use a hammer right.
A man can make a town of his
  As solid as a rock,
Remembering a hammer is
  To build with, not to knock.

Cal, the Carpenter, says:

When some people make a payment on account it is on account of wanting more credit.

What a woman generally wants is a big, large closet that doesn't take up any room.

If you don't think American ideas of elegance change, ask the fellow who used to make big money as a grainer.

A girl is married two or three weeks before she gets over believing that her husband could fix something if he only had the tools.

A man shingling a roof doesn't make many foolish remarks; perhaps it would be a good thing if he went all through life with a mouthful of nails.

A woman will often change your plans in this life, especially if you are a contractor.

A cussword is like a hammer handle—it has to be short so you can grab it in a hurry.

Most people have the kind of judgment that knows just how the basement should be excavated about the time they are shingling the roof.

There are some men mean enough to sell blue wallpaper to a woman with red hair.

The ordinary man doesn't want a fireproof house as much as a fireproof job.

We often hang a picture, when it ought to be the artist.

Some people aren't satisfied with the real things—they insist on having an imitation.

Some people's taste ought to be cultivated, and some plowed under.

Many a house has the knocker on the inside.

Every man to his taste, and even to some wallpaper.

A coat-of-arms may look well over a door, but a crimson rambler will give the world more joy.

When a girl tells a young fellow she will be satisfied with love in a cottage, he better find out what kind of a cottage she means.

Many a man who thinks he is going to have a house of his own will be lucky if he gets a latch key.

A friend in need is a friend indeed, unless he is in need of money.

Speaking of blueprints, the Kaiser's eldest must be about as blue as any.

Not Designed

There are remarks that hurt harder than criticism.

Younghusband had just finished kalsomining the kitchen, and called his bride to see.

"Oh, John," she cried, "what a pretty design!"

THE DREAM

The dream of home,
** A roof, a wall,**
That is the first
** Dear dream of all!**
Yea, from the first
** Within the breast**
Burns that desire,
** Life's loveliest.**
And, on the floor
** In infant days,**
We dream our dream
** In infant plays:**
The boy begins
** His house to rear,**
The girlie's dolls
** Are very dear;**
A little hand
** The cradle rocks—**
She soothes her dolls,
** He builds his blocks.**

Sad, But True

Some people seem to think that cement and lime and plaster and such things are material, and payment immaterial.

The Gentle Reminder

"What kind of a collection agency do you use?" asked the BUILDING AGE representative of the contractor at Grizzly Gulch.

"I don't have to use it," replied the contractor. "I just tote it."

He May Be Happier at That

"After they are gone," said the neighbor, "we often wish we had been a little less severe with our loved ones."

"Yes," sighed the widow. "I wouldn't let poor Henry smoke because it spoiled the curtains. But now he has gone where he can smoke forever."

The Rounder

Visitor—Does your husband get much pleasure out of his home?

Hostess—That's the trouble—almost all of it.

More Luck Than Science

"That green carpenter didn't do such a bad job with the Jones house."

"No, he builded better than he knew."

The Hard Part of the Trick

He was one of these men who extend well over the building line. In fact, he was what you might call fat.

He had just slipped on the top step and landed

on the sidewalk in front of a passing inebriate.

"Itsall right," said the p. i. admiringly, "itsall right. But how do you go up?"

Every Man to His Trade

"What was your principal occupation before you enlisted?" asked the officer.

"As a matter of fact," replied young Idelrich, "I didn't do much but play golf."

"All right, you can go down and shovel coal into the bunkers."

Over, if Anything

The bookkeeper had just consumed thirty-five minutes of the conversation to give a complete description of his vacation fishing trip.

"There's one thing about that bookkeeper," said one of the other boarders confidentially to a neighbor, "they will never be able to say that he is short in his accounts."

Getting blood from a turnip may be some job, but did you ever try to get heat from a janitor?

Unpleasant Memories

FRIEND.—Do you ever forget what people owe you?

DEALER.—Not often, but sometimes I try to.

Head On

The trouble with some competitors who want to get together is that they want to get together head first.

Keeping It in Circulation

"Did much money change hands at the Caledonian games at the Scotch picnic?"

"Oh, yes; several spectators were seen to have considerable money in their right hands and change it to their left hands."

As for talking too little or talking too much, more parrots have had their necks wrung than owls ever did.

The Age of the Truck

"How is your truck getting along?"

"Motor, or garden?"

And It Makes Father a Bear

"Pa, why is the man's room in a house called a 'den' "?

"Because it is occupied mostly by the mother and cubs."

The Amateur Architect

He built his house without the aid
Of architect or plan,
And yet one little error made
This most unhappy man.
It was an excellent affair:
Three stories, each a flat.
But anywhere
To put a stair—
He never thought of that!

A HISTORY OF CEMENT PRODUCTION

A very interesting compilation of the chronology of cement production which gives evidence of extended research by the compiler, is found in a pamphlet issued some years ago by a prominent cement company. The matter is of such interest that we present portions of it herewith for the benefit of our readers:

Ancient: Egyptians, Mexicans, Peruvians and the Greek colonists in Italy, used lime, more or less hydraulic in nature in much of their work.
500 B. C. Traces of Roman works using cementing materials, lime and puzzolona.
27 B. C. Dome of Pantheon, 142 ft. in diameter, built by Agrippa, is of concrete, using lime and puzzolona.
1100 A. D. Foundations of Salisbury Cathedral built of concrete, using lime and other cementing materials.
1485 Alberti describes mortar.
1568 Phillibert de L'Orme describes use of lime with river sand.
1570 Palladio describes uses of forms, cement, etc.
1756 Smaton used hydraulic lime in building the Eddystone Lighthouse.
1791-6 Patents granted Parker in England for "Ronan Cement," (a highly limed natural cement).
1796 The manufacture of natural cement commenced in England.
1802 Natural cement produced in small quantities in France.
1810 Patent granted Dobbs in England for Roman cement.
1813 Vicat commenced extensive manufacture from clayey limestone of artificial hydraulic cement in France.
1818 Discovery in United States of suitable rock for making natural cement during construction of Erie Canal. This was manufactured by White and sold for 20 cents a bushel.
1821-1829 Discovery at Siegfried's Bridge, Northampton County, Pa., of suitable rock for making natural cement.
1822 Frost commenced manufacture of artificial hydraulic cement in England.
1825 Cement rock discovered in Ulster County, New York, and natural cement manufactured there during the next year.
1828 Thames tunnel constructed using Portland cement.
1828 A cement mill was built at Rosendale, N. Y.
1829 Rock discovered near Louisville, Ky., and almost immediately thereafter manufacture commenced.
1845 About this date manufacture of cement established on a scientific basis.
1846 Discovery at Boulogne-sur-Mer of natural rock suitable for cement.
1850 Cement manufactured at Siegfried's Bridge.
1852 Mill for manufacture of Portland cement erected at Stettin, Germany.
1866 Saylor commenced manufacture of cement at Coplay, Pa., near Siegfried's Bridge, and commenced experimenting on methods of improving the quality of the output.
1872 Portland cement manufactured from marl and clay near Kalamazoo, Mich.
1875 First true Portland cement produced in Lehigh District, United States, by Saylor.
1875 A mill started at Washington, Pa., to use limestone and clay.
1899 Over 100 cement plants producing in Germany.
1902 Establishment of the Association of American Portland Cement Manufacturers.

DEMAND FOR MATERIALS STILL ACTIVE

Some observers, who have shown a tendency to emphasize the falling off in residential building, have entirely overlooked the enormous expenditure which the Government has embarked upon in connection with the cantonment construction. It has been estimated that the total cost of this work will be well over $50,000,000 and that it will not be completed until late in September.

The total cost of all residential building in the United States during the year 1916 was about $670,000,000. For July, August and September in 1916 it amounted to approximately $180,000,000.

Compared with these figures, the cost of the cantonment work will amount to over 7 per cent of the total residential building in the entire United States during the year 1916, and will be equivalent to nearly 30 per cent of the residential construction for the corresponding months of 1916.

It is thus evident that the general demand for building materials will not be greatly reduced.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

Recent Stanley Builders' Hardware

A burglar-proof lever flush bolt made of wrought steel with the exception of the extra long bronze lever has recently been placed on the market by the Stanley Works, New Britain, Conn., and an illustration of it is presented in Fig. 1. A feature to which special attention is directed is the arrangement of parts. The device locks on a dead center and the action being positive, the bolt, which has a ¾-in. throw, cannot be jimmied—a most important factor in these times when sneak thieves are operating more actively than usual in many parts of the country. It is designed for use on double doors and is mortised into the astragal or joint edge of the inactive leaf of a pair of doors, or applied on the inside face. With the mechanism occupying such small space and the plate extending the full length of the bolt it is easy to make a snug mortise as well as a neat looking job. The strike plate is self-centering and wide enough to allow for any reasonable shrinkage of the door. The springs are piano wire, durable and strong, and the screw holding power provided is ample for heavy doors. This bolt, known as No. 387, is made in 9 in., 12 in., 18 in. and 24 in. sizes and furnished in all standard Stanley finishes.



Fig. 1—Lever Flush Bolt

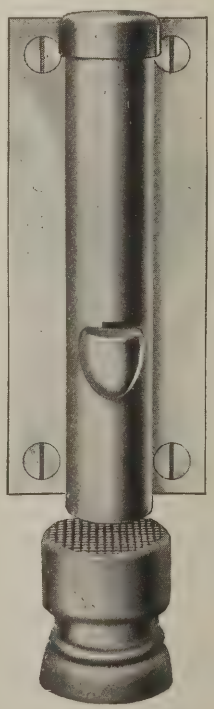


Fig. 2 — Remodeled Door Holder

Recent Stanley Builders' Hardware

The makers have recently remodeled their door holder shown in general view in Fig. 2, and now known as No. 456. It is stated that additions have been made in the mechanism of this holder which greatly increases its usefulness on doors in residences, offices, stores and public buildings. As remodeled, the wearing parts are durable, simple in design and of ample dimensions. It is convenient to operate because the foot-piece is near the floor and the "trip" is easily engaged by the foot. There are no sharp corners or edges to catch draperies or clothing. This new holder is said to have a wide range because of its long throw. The quality of the material is of the best wrought steel with piano wire steel springs and solid bronze trip. The working surfaces are extra large, thus insuring long life to the holder.

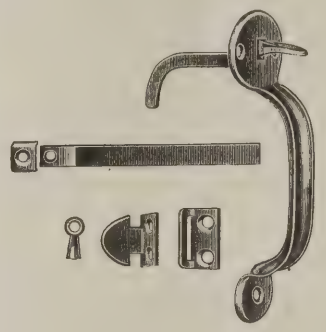


Fig. 3—Wrought Steel Thumb Latch

Still another addition to the already extensive line of builders' hardware which has been placed upon the market by the company is the wrought steel thumb latch illustrated in Fig. 3. Its parts are few and simple and the latch is said to be easily applied as may be inferred from a careful inspection of the illustration. It differs somewhat from the company's regular latch of the same class and character in that both the strike and the guide plate are made to be applied on the surface rather than to be mortised as is the ordinary practice, thus saving much trouble and expense in the labor of application. It is reversible for either hand and is packed one set in a box with screws to match.

Ambler Asbestos Building Products

Among the attractive literature which is being extensively circulated by the Keasbey & Mattison Company, Ambler, Pa., is an illustrated folder bearing the title "When Your Roof Wears out, What Then?" The answer immediately below it reads "Put on a Permanent Roof." The folder then goes on to state that Ambler Asbestos corrugated roofing and siding is a sheet concrete made from the highest grade of Portland cement and selected asbestos fiber. The process of manufacture is said to insure that the asbestos fiber shall each individually be coated with cement, that they shall be uniformly distributed and matted together and that there shall be no voids or fissures. The result is said to be a tough, resilient texture in which the asbestos fibers and cement colloids are intimately interlaced thereby utilizing the tensile strength

(*Continued on page 474*)

of the asbestos as the indestructible reinforcement for the cement. This material is said to become stronger and more resistant with age and is "permanent as the everlasting hills." This corrugated roofing and siding is made up in sheets 27½ in. wide, containing 11 corrugations, and in lengths of 4, 5, 6, 7, 8, 9 and 10 ft. It is said to be easily applied to steel framework in much the same manner as corrugated iron the purlins being spaced not over 36 in. apart for roofing and 40 in. apart for siding. A brief description is given of Ambler Asbestos building lumber which is made in the same manner in flat sheets without corrugation and is adapted to a wide range of uses. A list is given of United States Government installations of this material, also a list of a few of the many large concerns making use of it. The illustrations are halftone engravings and show the material itself as well as some buildings in connection with which it has been utilized to advantage.

The "Apsco" System of Gasoline Delivery

In these days of universal use of the automobile a gasoline delivery system operated by air pressure is of special interest to all concerned and what is known as the "Apsco" gasoline and oil storage and distributing system is likely to receive more than passing attention. It is claimed to have been approved by the Board of Fire Underwriters and its special meter by the Department of Weights and Measures of the City of New York. The "Apsco" meter is said to measure the actual amount of oil or gasoline sold or consumed and shows at a glance the exact individual quantity drawn off and the total amount used. The claim is made that it can be installed in old as well as in new buildings at very moderate cost. We understand that agencies are wanted by the Allen Pressure System Co., Inc., 16 to 24 West Sixty-first Street, New York City, and from which descriptive literature regarding the "Apsco" system may be obtained for the asking.

The Security Windowlock

A lock for securely fastening window sash in an open or closed position has recently been placed upon the market and illustrations of the device are presented herewith. The lock is based, we understand, on the old well-known laws of gravity and leverage, and when applied to the sash the window is always locked whether it be left opened or closed. The device is applied to any sized window by simply fastening with

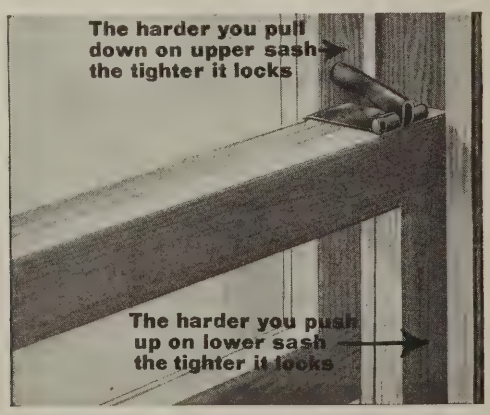


Fig. 4—Showing Application of Lock to Window Sash

two small screws to the top of the lower sash as shown in Fig. 4. In the end of the top or loose member, there is a rubber buffer which falls by gravity against the upper sash. When trying to pull down the latter the rubber holds it securely and pressure is exerted against the leverage so that the harder one pulls down the tighter it locks. The same principle applies to the lower sash so that the harder one may push up on it the tighter it locks. This pressure of both sashes against the window frame keeps both windows from rattling. The claim is made that the window cannot be forced open with a jimmy as the sash will break before the lock would release its "bulldog" grip. The device is made of heavy sheet metal and the rubber



Fig. 5—General View of the Device, Actual Size

buffer, it is claimed, will not mar the woodwork. It is offered in attractive oxidized copper finish. There are no springs or bolts to get out of order and the device is therefore of simple construction. Fig. 5 represents the device itself before it has been applied to the sash. It is made by the Utility Specialties Company, 1900 Euclid Avenue, Cleveland, Ohio.

Points on Hydrated Lime Plaster

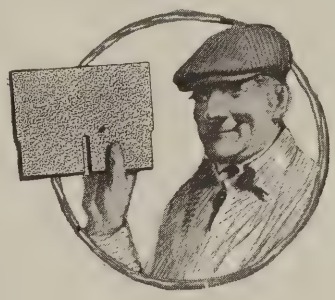
Some very interesting information bearing upon the advantages of hydrated lime plaster for scratch and brown coats, as well as for deadening purposes, is contained in the literature being sent out by the Hydrated Lime Bureau—Norman G. Hough, manager—1509 Arrot Building, Pittsburgh, Pa. Doubtless there are many plasterers who recall the days when no other material but lump lime was used for scratch and brown coat interior plaster. They will also recall how patent plaster gradually took the place of lump lime, and now some of these men are witnessing another change, this time the demand being for lime plaster—not lump lime, but the modern and convenient hydrated lime. The question is naturally asked, why was lump lime relegated to the background? The answer to the whole question is that lump lime was inconvenient and when a new material was brought into the market which eliminated the inconvenience of slaking and tempering, mechanics were only too willing to accept the new, modern and more convenient material. In hydrated lime plaster, contractors have a material that is said to give the same good results that were formerly obtained with lump lime plaster, but in hydrated lime the inconveniences common to lump lime are eliminated.

When hydrated lime is delivered to the job for brown coat purposes it is necessary only to mix it with the proper proportion of sand and water and it is ready for application to the walls. It is no longer necessary to soak the material over night, or for several days or a week as was formerly the case with lump lime. Lime, when brought to a paste by mixing with water, is very plastic, and when mixed with sand gives an easy working mixture under the trowel. This it is pointed out is the reason why hydrated lime is being accepted as a standard material by many plastering contractors. A plastering material that so hardens as to make it an excellent non-conductor of sound is in great demand by the architectural field. The volume of sound transmitted to other rooms is dependent very largely upon

(Continued on page 22 of the advertising section)



They Appeal to the Majority



Because of their beauty, Neponset Twin Shingles are popular with people who can afford to pay twice their price. The man with a moderate income can buy no more economical shingles, because of their great durability and fire-resistance.

NEPONSET TWIN SHINGLES

Slate-Surfaced, Fire-Resisting

(Patent applied for)

have been termed "The Roofing Development of the Twentieth Century." If you want to know more about this popular roofing from the standpoint of profits, fill out and mail the coupon. Remember to be known as the Neponset Man in your town means a substantial big-paying roofing business. Are you interested? Then write without delay.

BIRD NEPONSET PRODUCTS

Look for this trademark on all Shingles, Roll Roofings, Wall Boards and Building Papers. There is one meeting every requirement and purse—all guaranteed by us.

Bird & Son (Established 1795) Dept. B **East Walpole, Mass.**

NEW YORK CHICAGO WASHINGTON

Canadian Office and Plant HAMILTON, ONTARIO

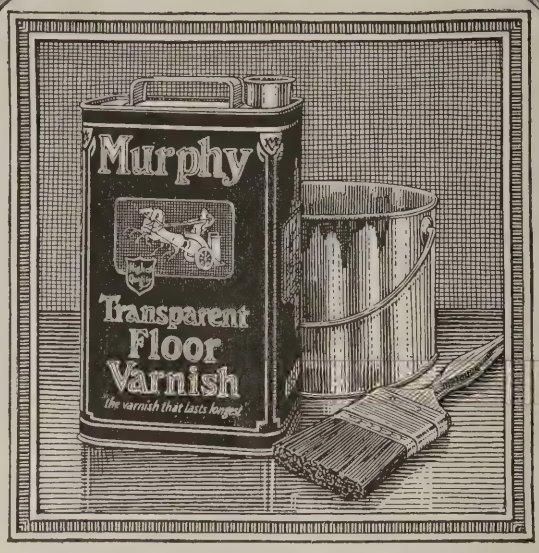
BIRD & SON

Dept. B, East Walpole, Mass

Please send me information about Neponset Twin Shingles and Neponset Wall Board. Also a copy of your book, "Repairing and Building." This request does not obligate me in any way.

Name .....

Address .....



The can that insures the job

Why not go the whole way?

In some lines of merchandise it may pay to compromise—to use the second-best. This may be so; but we are sure you will agree that there is no place in your business for a second-rate varnish.

Murphy Varnish

"the varnish that lasts longest"

is the kind of varnish on which to build a permanent business. It is true for us and we believe it is true for you. Poor varnish is a snare and a delusion for all concerned. Let us teach the public to have none of it. We do our part by making "the varnish that lasts longest" and by telling the public —your customers—the facts about it in our national advertising. That makes your part easy.

Send for further information about our products.

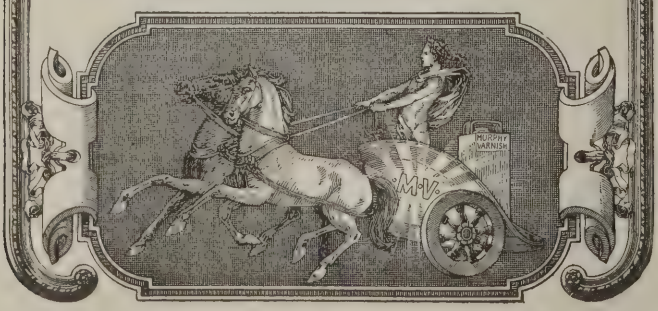
Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A



(*Continued from page 474 of the editorial section*)

the volume of sound which the plaster is capable of absorbing and deadening, and this volume is determined largely by the nature of the plaster in its hardened state. Hydrated lime plaster is claimed to be one of the best methods of keeping noise from being transmitted from room to room in a house without going to considerable expense to install various other sound deadening materials. Again hydrated lime plaster is said to cost no more per square yard for any particular class of work than other plaster.

Edwards Rolling Iron Doors Save Much Damage

A very striking example of the value of rolling iron doors in preventing great damage to property is found

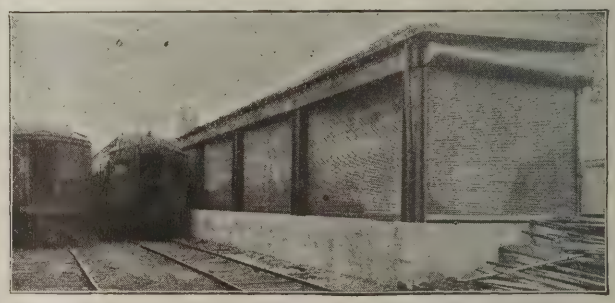


Fig. 6—Exterior View of Locust St. Pier in Philadelphia, After the Fire Mentioned

in the case of the recent fire at the Locust Street pier of the Baltimore & Ohio Railroad in Philadelphia, Pa. One end of an automobile platform was inclosed by means of Edwards' galvanized iron doors so that the better grade of cars which it was necessary to leave on the pier over night could be run into the inclosed platform and the doors lowered to protect them, as shown in Fig. 6. According to a report of the fire, there were six Buick cars on this end of the platform, together with a large pile of lumber, and when the fire was discovered it was burning fiercely and before it was extinguished completely ruined all of the automobiles and lumber, as well as having burned the entire roof off the platform.

On one side of the platform there were box cars

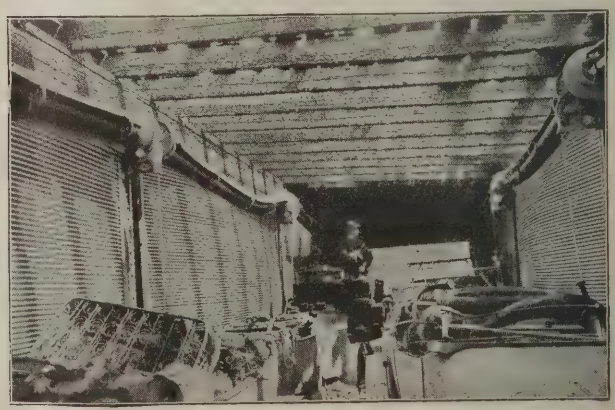
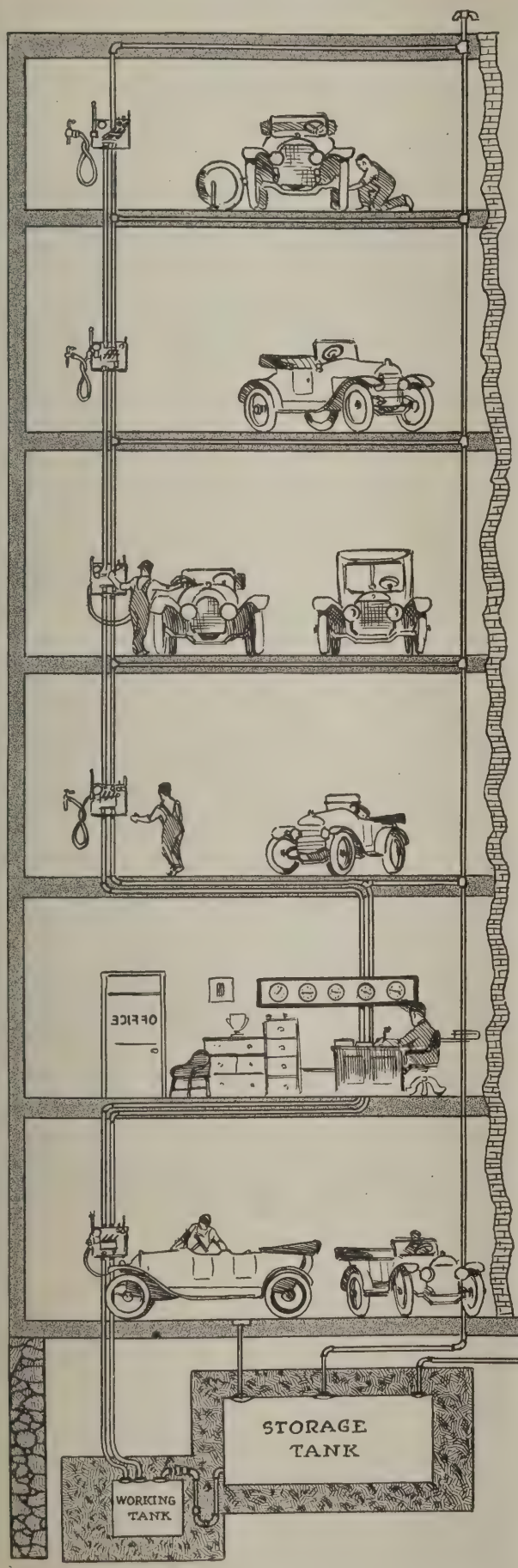


Fig. 7—View Showing Edwards Galvanized Iron Doors Still in Service

loaded with automobiles, three tracks each, and on the other side were Pullman cars stored in the yard. These cars were only 18 in. outside of the rolling iron doors, and the paint was slightly blistered, but no damage done to the cars. If the doors had not been there to protect them it is probable the cars would

(*Continued on page 24*)



Gasolene

"pumped by air" no labor

A Gasolene Delivery System That Protects Buyer and Seller

Operated by Air Pressure

The many advantages and practical improvements embodied in the "APSCO" Gasolene and Oil Storage and Distributing System eliminate all waste and guess work, reduce labor-cost and give adequate protection against danger from fire and explosion.

Simple Economical Safe

Approved by the Board of Fire Underwriters

Simplicity of construction and operation is secured by discarding cog-racks, pinions, bearings, pistons, cup leathers, piston valves and gearing. Wear and tear are reduced to a minimum. The air-pressure system secures a responsive flow of oil or gasolene to any desired point of use—direct from the storage tank to vat, tank or machine—without the use of labor, pumps or any auxiliary mechanism.

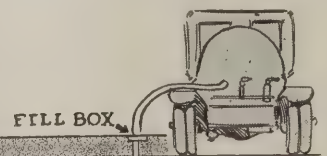
SPECIAL APSCO METER

Approved by the Department of Weights and Measures of the City of New York

This "APSCO" meter measures the actual amount of oil or gasolene sold or consumed. Shows at a glance the exact, individual quantity drawn off, and the total amount used.

The APSCO is Easy to Install

The "APSCO" System is adapted to the multi-storied garage, or the smallest one. It may be installed in old or new buildings. Old style systems can be changed over. The cost is moderate, and varies with the amount of piping, the size of storage tank, and the number of outlets.



Our staff of engineers and designers is at your service, and is ready to furnish careful estimates of the cost of installing the "APSCO" System to meet any particular requirements.

Descriptive Literature Mailed Upon Request.

Agencies Wanted

ALLEN PRESSURE SYSTEM CO., INC.

16-24 West 61st Street New York



"Has it a Built-in Bath?"

That is the first question asked by the woman who goes to look at a new house.

America's foremost built-in bath is the "Viceroy," a notable example of

KOHLER WARE

always of one quality—the highest

The "Viceroy" is of genuine *one-piece* construction; it is enameled all over; the design is beautiful and hygienic, and owing to manufacturing economies it is available for all classes of houses and apartments.

Be sure to choose the "Viceroy." It will be a permanent addition to the attractiveness of the house or apartment you are building.

KOHLER OF KOHLER manufactures first quality bath tubs, lavatories and sinks to suit *all* requirements.

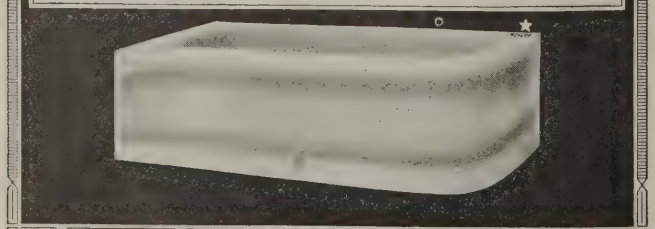
KOHLER CO., Kohler, Wis.

Founded 1873

Boston New York Philadelphia Pittsburgh
Detroit Indianapolis Chicago
St. Paul St. Louis Houston San Francisco
Los Angeles Seattle London

★ *The star indicates the location of the KOHLER permanent trade-mark in faint blue*

"Viceroy" Bath—Plate V-14
(Patent Applied For and Name Registered U. S. Patent Office)



have been absolutely ruined, as it was a very hot fire. The doors remained intact and in position with the exception that the shaft sagged about 12 in. in the center from excessive heat and the malleable iron gears were melted and warped in some cases, all as seen in Fig. 7.

Sanitary Barn Equipment

In the building of the modern barn, improved dairying conditions render necessary the installation of equipment which shall be as sanitary as possible. The builder who is accustomed to meet these conditions will find much to interest him in a booklet entitled "Strickler Sanitary Barn Equipment," which is being distributed by the Strickler Hay Tool Co., Janesville, Wis. Illustrations of various types of equipment are contained therein and a caption beneath each style points out some of the more important features. The catalog states that any combination can be used so that an outfit can be gotten for the barn that will exactly fit its needs, so that it is really a made-to-order proposition at the cost of regular stock goods. One of the interesting features is the double lock on the stanchion, which can be opened from either side of the cow, so that two can be handled at one time—one with each hand. Various other types of stanchion fasteners are also shown. Line drawings and descriptions show the manner in which the stalls are put up. The catalog contains descriptions and illustrations of calf pens, bull pens, feed and litter carriers of various types, etc.

The Berg Rotary Concrete Surfacer

A portable electric-driven tool for surfacing side walls and ceilings at what is said to be an extremely low per-square-foot cost is the Berg Rotary Concrete Surfacer illustrated in Fig. 8 and shown arranged for

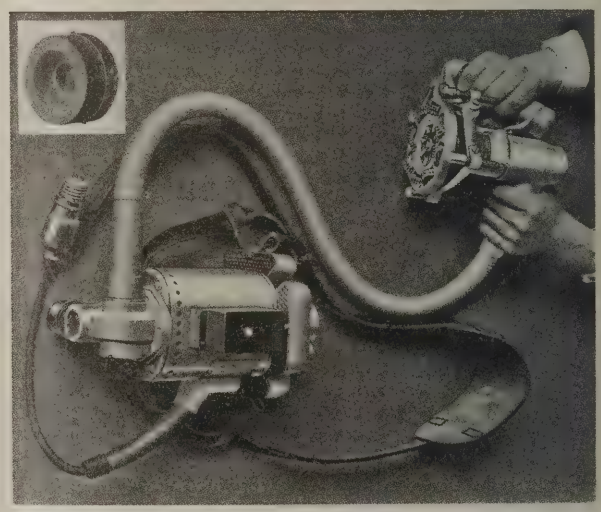


Fig. 8—View of Berg's Rotary Concrete Surfacer As It Appears in Actual Use

side wall work. This surfacer comprises a cutting tool driven through a flexible shaft by an electric motor carried by the operator as shown in the picture. The cutting tool consists of a disc in which are mounted sixteen hardened steel cutter wheels. The latter roll on the surface to be dressed and are so designed that their teeth remove the material by a chipping action. These teeth are in effect miniature hammers which strike innumerable blows per minute. The machine is provided with ball-bearings throughout and the driving motor is said to be equally efficient on either alternating or direct current. A special carborundum stone grinding attachment is included as a part of the equipment, this attachment being interchangeable with the

(*Continued on page 26*)



CORBIN AXLE PULLEYS

are made with ball-bearings, roller-bearings and plain bearings, with wheels turning freely on heavy fixed axles; in any size or metal desired and with wheels grooved for rope, chain or ribbon. They are accurately made to standard gauges, rigidly inspected and give satisfaction under the most severe conditions. They are specified for the best buildings by architects who have learned their value. Full particulars on request, or from any dealer in Corbin hardware.

P. & F. CORBIN

The American Hardware Corporation, Successor

NEW BRITAIN, CONN.

NEW YORK PHILADELPHIA CHICAGO



Fiberlic

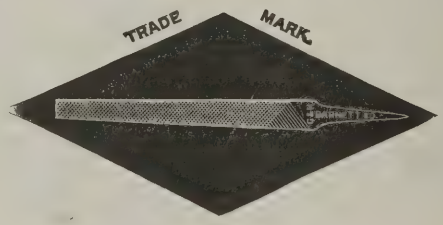
Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.
Owned and Operated by Nicholson File Company

cutting tool and is used for grinding in a mixture of cement and sand which is swabbed on the surface after the board marks and projections have been thoroughly removed by the cutting tool. The latter weighs only 9 lb. and the entire apparatus, including the motor, weighs 30 lb. The machine is being introduced to the attention of the trade by the Elevator Supplies Company, Inc., with general sales office at 119 West Fortieth Street, New York City.

Disston Issues Internal House Organ

Henry Disston & Sons, Inc., Philadelphia, Pa., has inaugurated a monthly house organ for employees of the company, the first issue of which appeared July 2. The title of the publication is "Disston Bits," which has a double significance, "bits" being another name for the teeth of inserted tooth saws, one of the company's products. As the announced purpose of the publication is the stimulation and crystallization of good will and fellowship among the employees, it has been considered desirable that all illustrations, cartoons and editorial matter be the work of the employees themselves and the paper is being published along these lines. From the appearance of the first issue there is every indication that ample talent is available among the 3600 employees of the company to produce a very creditable publication. "Disston Bits" has eight pages, 9 x 12 in., and comprises several departments, including editorial, sports, safety first, etc. "Disston Bits" will not in any way conflict with the "Disston Crucible," the trade organ of the company, which has been issued for several years, as the objects and purposes of the two publications are entirely dissimilar.

The Shafer Ventilated Chemical Indoor Closet

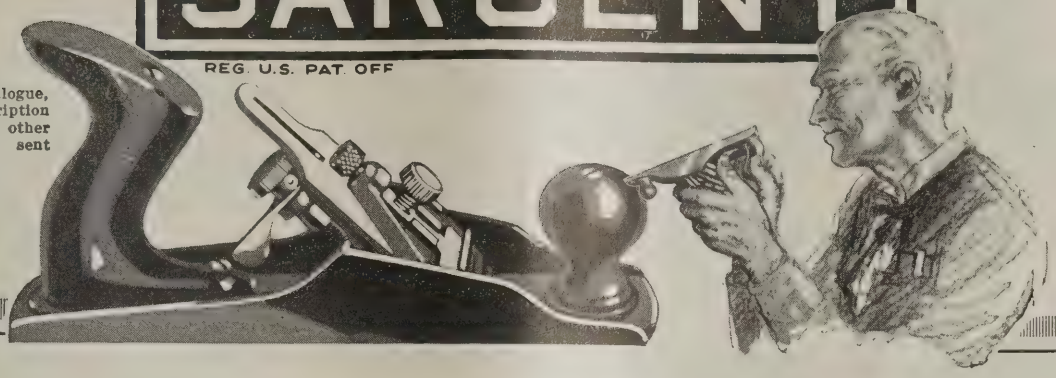
One of the necessary inventions of modern times which has been developed to meet the need of the farmhouse or other country dwelling located where there is no public sewerage system is the chemical indoor closet, which is in many districts doing away with the unhealthy and inconvenient privy. The Shafer Mfg. Company, Toledo, Ohio, is distributing a booklet entitled "The Shafer Ventilated Chemical Indoor Closet," which is stated to be a new invention that solves the one humiliating problem of the country, the village or the suburban home. The advantages of a chemical closet over a privy are too obvious to call for extended comment. This chemical closet has a base and super-rim, or what might be termed the framework of the cabinet outer container, made of solid cast metal. Upon the base a flange with holes for screws is placed so that the closet can be temporarily or permanently fastened to the floor. Within the upper or super-rim are three metal lugs which support and hold in proper position the inner container or chemical retort. There is also a separate cast metal projection at the rear for holding the seat and cover securely with nickeled metal hinges. The cylindrical wall of the outer container is of rolled sheet steel which, together with all other metal parts, including 10 ft. of 3-in. exhaust pipe, is enameled in azure blue. The seat and cover are both of genuine birch-mahogany and are said to be identical in size, materials, design and finish with high-grade water flush closet seats. A rubber bumper protects the exhaust pipe from the seat cover when it is raised, and a rubber bumper cushion protects both seat and cover, giving them noiseless operation. The inner chemical container is of gloss enameled steel and is said to be impervious to acids, etc., and to not absorb odors, fumes or moisture—being consequently always clean and sanitary. A hole around the top part of the cabinet admits air into it, which goes up the exhaust pipe and is said to carry off all fumes with it. Numerous pictures of installations are presented in the booklet and testimonials from their users are given.

(*Continued on page* 28)

SARGENT

REG. U.S. PAT. OFF.

Plane catalogue, with full description of these and other Sargent Planes, sent on request.



YOU'LL BE PROUD OF YOUR NEW AUTOMATIC

judging from the enthusiastic letters we have received from Proud Tool users. They all agree that their *Sargent Automatic-Set Bench Plane* is "The Best Plane Yet Out." Made in Six Sizes, the Superior Features to be appreciated by tool users are:

AUTOMATIC SET—The clamp, when replaced after removal, will always return to its original position until reset. This feature is a great time-saver. The clamp may be easily adjusted, by means of a regulating screw, close to the cutting edge when a fine cut is required, away from the cutting edge when a coarse cut is desired and may be set in as many intermediate positions as may be needed.

RIGIDITY—The Frog is very rigid and the Frog and Bed at the mouth are in alignment so that the cutter has an even bearing down to the bevel of the cutter. The Plane combines solidity, compactness and simplicity. The meeting surfaces of the Frog and Bed are all machined so that the fit is absolute.

EASE OF ADJUSTMENT—The lateral adjustment may be secured without removing the hand from the handle and the vertical adjustment, obtained through a direct acting thumb screw at the back of cutter, is positive and rapid.

SINGLE BIT—These Planes have a thin Cutter (No. 14 gauge), but the support for the Cutter is so solid below and the clamp so firm above, that there is no tendency to chatter, hence it is possible to use the thin Cutter and so get the slight advantage of the quicker grinding. The Cutter requires no cap as the clamp acts as a breaker for the chip.

PURPOSE—These Planes are intended for both heavy and very fine cuts. They are especially adapted for working against the grain on cross-grained hard wood where the absolute rigidity of the cutter avoids any tendency to chatter.

SARGENT & COMPANY, MANUFACTURERS

53 WATER STREET NEW HAVEN, CONN.



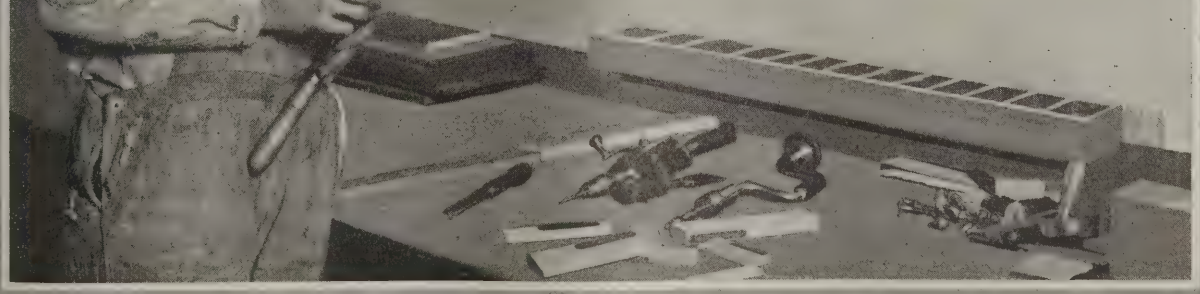
Carborundum Sharpening Stones Keep Edge Tools on the Job

WHEN a chisel, a gouge, or a plane bit begins to lose its edge—fails to cut true and clean—you needn't lose much time or spend much effort in putting it back on the job.

Carborundum Sharpening Stones

Bring back the edge in a jiffy—just a few rubs and the tool is right again—fit and ready for the work. There are no sharpening stones that cut so fast and clean—that hold their shape—that last so long.

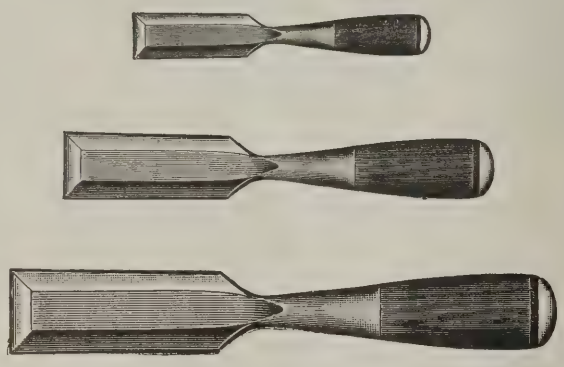
Ask Your Hardware Dealer



The Carborundum Company, Niagara Falls, N. Y.

New York Chicago Boston Philadelphia Pittsburgh Grand Rapids Cleveland Milwaukee Cincinnati

Stanley Tools



STANLEY
"EVERLASTING CHISELS"

Strongest, Fastest, Most Durable Chisels Manufactured

Blade, Shank and Head One Piece of Steel

Exceptionally well made and highly finished.

May be had singly or in sets, packed in canvas rolls or fancy hardwood boxes.

Made in All Standard Sizes

Special circular upon request

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

Value of Using Fire-Resisting Building Materials

A most striking example of the value of using fire-resisting materials in connection with building construction is found in the case of a motion picture theater and apartment building at Uhrichsville, Ohio, which was partially destroyed by fire. The first floor of this building was constructed of wood and the second floor with Berger's metal lumber. As might naturally be supposed the wooden floor burned freely and was practically destroyed while on the other hand the metal lumber on the floor above tended to prevent the fire from getting beyond the first floor. The point is made by the Berger Mfg. Company, Canton, Ohio, makers of the metal lumber in question, that fires of this character prove the importance of using fire-resisting building materials throughout. The claim is made that metal lumber can be worked almost as readily as wood and at the same time gives an economical fireproof construction, being adapted to any size or type of building.

American Ready Wall Board

The advantages of American Ready Wall Board are set forth in a folder which is being distributed by Bird & Son, Dept. B, East Walpole, Mass. The material is intended for use in new buildings for partitions, interior of moving picture theaters, factories and other places where an inexpensive wall board is desired. In order to make a partition, it is said that it is merely necessary to place the studs on 16-in. centers and then nail the board to them, wooden battens being placed over the cracks between the sheets of wall board. The material is furnished in sheets from 7 to 12 ft. long and either 32 or 48 in. wide. It is said that it can be cut with a heavy sharp knife or with a saw, thus making the material very easy to handle.

New Catalog of "Corr-Mesh"

Corr-Mesh is a stiff-ribbed diamond mesh expanded metal employed in connection with reinforced concrete, plaster and general stucco work. Two kinds are manufactured, one having ribs ¾-in. high and the other having ribs 5/16-in. high. The Corrugated Bar Company has just issued a very attractive and useful catalog relating to this material. The forepart of the catalog is given over to a detailed description of the material, its advantages and various applications. The pages following are devoted to designing tables, graphical construction details and specifications relating to the use of Corr-Mesh in partitions, exterior walls, floors, roofs and ceilings respectively. Construction photographs showing the method of handling and erecting the material, and incidentally, its wide and universal application, are scattered throughout the catalog with pleasing effect. The catalog contains much data which is valuable to the architect, engineer and contractor, and copies may be procured by addressing the Corrugated Bar Company, Mutual Life Building, Buffalo, N. Y.

The Dixie Bar Bender

The Dixie Bar Bender is intended for use in the bending of reinforcing rods at any degree from 0 to 180, or a complete hook. The main feature of the machine is that it will bend beam rods as well as floor rods. Another feature is the changeable resistance block when changing from one size rod to another, there being no nuts or bolts to manipulate. The claim is made that the rods will be bent by the machine at the exact place desired, as there is no creeping while bending. The machine weighs 175 lbs. without the pipe handle. It is said that it is possible to bend simultaneously two ¾ square bars three ⅝ square bars, or four ½ square bars. A folder illustrating and describing this machine is being distributed by the manufacturers, Jameton Patent Bender Company, San Antonio, Texas.

(*Continued on page* 30)



Most of You Mechanics Use

DISSTON
SAWS AND TOOLS

Do You?

Ask any hardware dealer what saw the mechanic prefers and the chances are he'll tell you the **Disston.** Most mechanics do use the Disston—a recent investigation again proved that fact.

The endorsement of the majority of skilled artisans, men whose livelihood depends on tools, ought to be a pretty safe guide.

The chances are more than even that you use the Disston now; but if you don't, try them next time.

HENRY DISSTON & SONS, Inc.
PHILADELPHIA, U. S. A.

Branches:

Chicago Boston San Francisco Cincinnati New Orleans Memphis
Portland, Ore. Seattle Bangor Vancouver, B. C. Sydney, Australia
Canadian Works: Toronto, Canada

TRADE MARK REG. U.S. PAT. OFF.

Pullman Unit Sash Balance

Cost Less Than Cords and Weights

Made of Steel

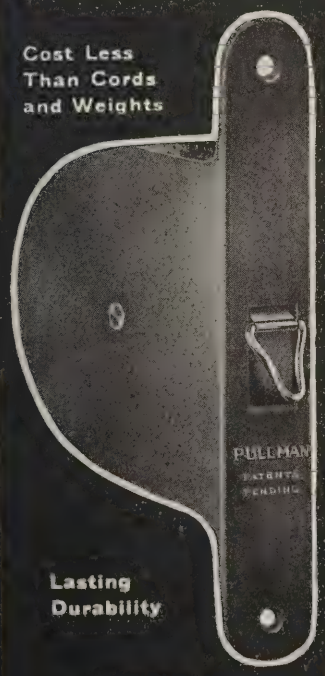
Practically Noiseless

Easy to Install

Approved by Architects and Fire Underwriters

Write today for Catalog with Blue Prints and learn why you can save money.

Lasting Durability



Pullman Mfg. Company
8 Industrial St., Rochester, N. Y.

Pullmanize Your Windows

"YANKEE"
Push Drill No. 44

Saves Time at Every Turn

Here you have a rapid fire drill, with adjustable tension, for hard or soft woods and the 8 different size Drill Points furnished with it.

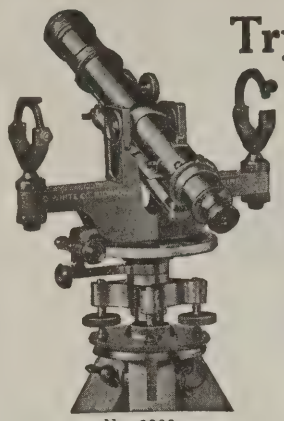


A turn of the cap does the trick that saves you time, labor, and Drill Points. This drill is about as valuable to the average mechanic as any "Yankee" Tool we make. Built for hard service.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.
Lehigh Ave., Philadelphia, Pa.



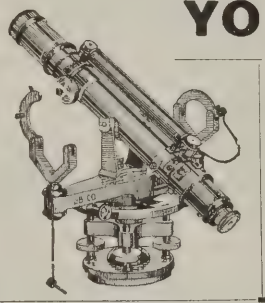
No. 2020

Try a "WHITE" Level for 10 Days—Free

Use it for ten days on your own work in your own way. **We let you be both judge and jury.** After you have worked and lived with one of our convertible levels for ten days you will either like it or dislike it. If you decide against the level, simply box it up and ship it back and **we will take it good-naturedly.** Circular tells all—ask for it.

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN

BUY YOUR LEVEL NOW

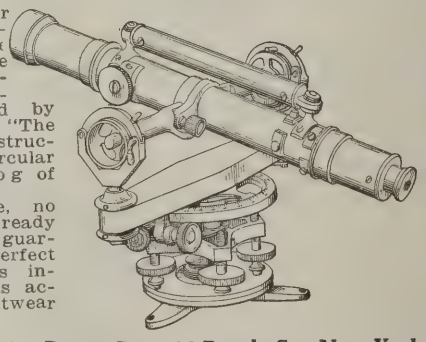


Send for Booklet E today and let us show you how you can save money by purchasing your Architects' Level now. Excellent instruments at surprising prices. Write at once.

The L. Beckmann Co.,
Estab. 1874 Toledo, Ohio
No. 300 Jackson St.

Improved Convertible Level

The instrument for the critical man—every part is made from the best grade material; each instrument is assembled and tested by expert workmen. "The acme of level construction." Ask for circular "B" and catalog of drawing material. No pins to lose, no screws to tighten, ready in an instant and guaranteed to give perfect satisfaction. This instrument holds its accuracy and will outwear any other.



New York Blue Print Paper Co., 102 Reade St., New York

KOLESCH
"BUILDERS"
Tilting Level



No. 7850

Designed particularly for the leveling and plumbing of walls, giving lines and levels for buildings, laying out angles, grading streets, sewers, drains, etc. Sturdily built for durability, yet sensitively accurate.

Sold complete in a polished box with plumb bob, adjusting pins, metal trivet, book of instructions, and tripod for $57.50

KOLESCH & COMPANY
138 Fulton Street, New York, N. Y.

Lansing No. 5 Broncho Special Concrete Mixer

There are many contractors who have probably often had occasion to use a very small sized concrete mixer, for there are many jobs which are so small that just the cost of moving a heavy machine would turn the profit into a loss. To such the Lansing No. 5 Broncho Special concrete mixer, manufactured by the Lansing Company, 21 Cedar Street, Lansing, Mich., will prove of interest. It is stated to have a capacity of one-sixth of a yard, is said to be more easily moved around than a mixing box and to be adapted for mixing not only the ordinary run of concrete, but also to be equally well adapted for mixing cinder concrete, top dressing and cement or lime mortar, so that for the average contractor or builder who puts in a foundation one day, a sidewalk the next, and lays brick shortly after that, this mixer will command more than passing attention. It is said to be easy to shovel into and to discharge into a wheelbarrow. The mixer weighs 1500 lb. and can be pulled around behind a wagon or buggy or even by hand. The wheels are high with 3 in. tires, cast hubs, and staggered steel spokes. The wheels are said to be strong enough for a mixer of twice their weight, which is an excellent advantage when it has to be moved about on rough streets or country roads. There is said to be absolutely no setting up with this machine and no platforms to be erected. It is ready to shovel into as soon as it is placed on the job and the engine is started. The engine and drive mechanism are covered with a steel housing, thus keeping out the dust, dirt and inclement weather from the vital parts of the machinery.

Durability of Expanded Metal Lath

An excellent example of the durability of expanded metal lath has recently been brought to the attention of the Northwestern Expanded Metal Lath Co., 904 Old Colony Building, Chicago, Ill., by Architect Arthur H. Ebeling, Davenport, Iowa, who sends to it several samples of 24-gage "Kno-Burn" expanded metal lath that had been removed from the exterior of a residence in that city to which an addition was being built. The architect says in regard to it: "In removing the exterior stucco and lath I observed the excellent condition of the metal lath which was applied nine years ago and is in exactly the same condition that it was the day it was put on, having taken on no rust whatever. The stucco applied was cement mortar as a scratch coat—enough to thoroughly imbed the metal lath. The second and third coats were of cement mortar with a small proportion of lime added to act as a retarder. No waterproofing of any description was used on this work."

Equipment for Selling Homes

Of decided interest to the dealer in building supplies is a recent number of Curtis Service, the monthly house organ of the Curtis Companies, 1617 to 1717 South Second Street, Clinton, Iowa. One article entitled "What a Porch Can Do" contains an "ad" which is especially suitable for a lumber dealer to use in his local newspaper if he is looking to extend his business along lines of bringing houses to a more up-to-date appearance. The "ad" presents pictures of a house before and after a porch was built on, so that a very clear idea of the beauty which a porch lends to a house can be gained. The descriptive matter points out the comforts which a porch supplies. Another article entitled "The Equipment for Selling Homes" points out some of the features which the successful dealer should be familiar with so that he may present to a client in a clear and concise manner any information which he may desire. To this end, catalogs that display such items as built-in furniture, stairs, hardware, and the like in as attractive and as true-to-life a manner as

(Continued on page 32)

GOODELL-PRATT



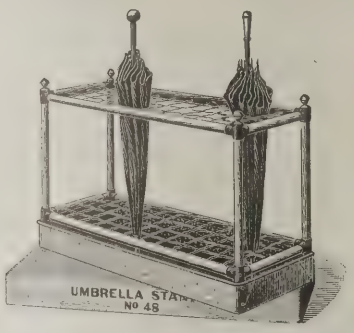
1500 GOOD TOOLS

Write for Complete Catalog

Goodell-Pratt Company
Greenfield, Mass.

Toolsmiths

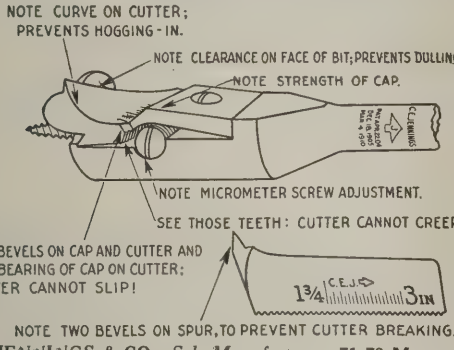
"Ideal" Umbrella Holder



An attractive, durable piece of furniture. Occupies small space; can be filled or emptied without halting a line of pupils as they pass it. Regular school size holds 48 umbrellas. We ship it in its own drip pan—package 4" x 15" x 39", total weight 25 lbs. Sample on approval, if all express charge is paid.

THE W. J. CLARK CO., Salem, Ohio

C. E. Jennings ARROW HEAD Trade Mark Expansive Bit
STEERS PATENT



C. E. JENNINGS & CO., *Sole Manufacturers*, 71-73 Murray St., N. Y.

Pearson's Automatic Shingle Nailer



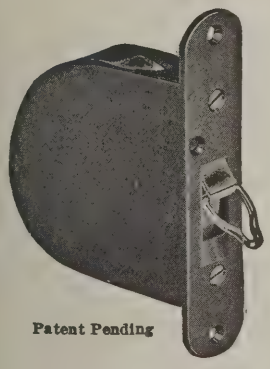
Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

PAYS ITS COST ON ONE JOB

Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.
List price $7.00 (*but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars*).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools

CALDWELL SASH BALANCES UNIFORM MORTISES



Patent Pending

For use in all classes of new work

Box frames unnecessary

Mortises cut at mill reduce cost of installing. Counterbalance sashes at any given point. They outwear ordinary weights and cords. Unaffected by atmospheric conditions.

Cheapest method for modernizing old windows, as alterations in sashes and frames are not necessary. Sashes should be weighed before ordering.

Write for Circular

Caldwell Mfg. Company
5Jones St., Rochester, N. Y



Degrees: 2B to 6H; uniformly graded.

Point Perfection

is assured with

Excello Pencils

Made specially for technical drawings.

EUGENE DIETZGEN CO.
Manufacturers
Chicago New York San Francisco
New Orleans Pittburgh Philadelphia

COPPER CABLE SASH CHAIN

Thomas Morton

245 Centre Street
NEW YORK

COPPER CABLE
STEEL CABLE
CHAMPION METAL
STEEL CHAMPION

SASH CHAINS

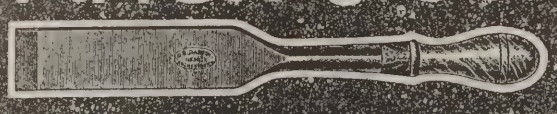
CHAINS

For Suspending Heavy Doors
Gates, Etc.

All of SUPERIOR QUALITY

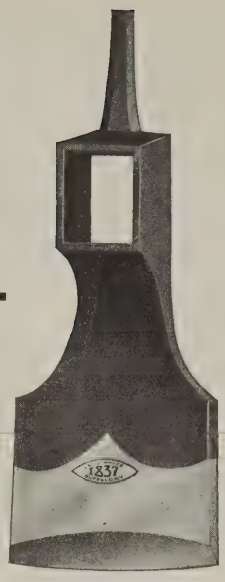
CHAMPION METAL SASH CHAIN

MACK & CO.



YOU will always feel secure when you use Barton Planes and Edge Tools. The making of keen edged tools that hold their sharpness is our hobby. If your dealer won't supply you we will.
There is some mighty interesting and profitable reading in "The Carpenter's Catalog" and "True Stories." Both free, of course.

Brown's Race & Platt St., Rochester N.Y.



Carpenter ADZE

Ship ADZE

THE BEST — — THAT'S ALL

Send for Our Catalogue

THE L. & I. J. WHITE CO., 100 Perry St., Buffalo, N. Y.

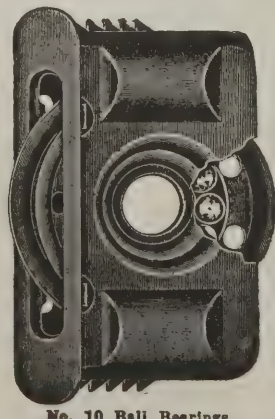
ORIGINATORS OF SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government** for over **30 Years.**



The Smith & Egge Mfg. Co.

BRIDGEPORT, CONN.



No. 10 Ball Bearings

"Grand Rapids" All Steel Sash Pulleys

Fasten automatically. No nails. No screws. Just bore 4 holes.

The automatic saw tooth fastening feature and the easily made mortise will save in labor the cost of the pulleys.

Frictionless, Noiseless, Everlasting.

Write for free samples.

Grand Rapids Hardware Co.

160 Eleventh Street, Grand Rapids, Mich.

possible are a decided help in making it easy for the customer to buy, and therefore for the dealer to sell. The issue also contains pictures of exterior and interior finish which the Curtis Companies are prepared to furnish.

"Duro" Pumps and Systems for Water Supply

The contractor who is often called upon to erect buildings in localities where there is no public water system will find much to interest him in a booklet entitled "Duro Pumps and Systems for Residence Water Supply," which is being distributed by the Burnett-Larch Manufacturing Co., Dayton, Ohio. These systems are intended for either deep or shallow wells, cisterns, lakes or streams, and are of undoubted aid in adding comfort to the finished country residence. Illustrations and descriptions of the outfits particularly adapted for these various purposes are contained at length, together with line drawings which show the best method of installation, full details being given. It is interesting to note that every "Duro" pump or water supply system is guaranteed to be free from defects in workmanship, material or design for a period of one year, and any part or machine proving defective within this period will be replaced without charge. The price of one of these outfits is said to be so reasonable that even the smallest householder can afford one and, therefore, they are particularly adapted to a popular distribution.

"Insulite" for Insulating Buildings

We have just received from the manufacturer a sample of what is known as "Insulite"—a material for insulating dwelling houses, cold storage buildings, incubators, refrigerators and, in fact, all places where a thermal insulation is required. It is also referred to as an efficient sound-deadener for all buildings. The material was patented a short time ago and is made by the International Insulation Company, International Falls, Minn., and with Chicago offices at 1311 Lumber Exchange in charge of Thomas S. Toomey, assistant to the president. Insulite is said to be made solely from selected spruce wood fibre felted into strong even sheets which can be handled and applied like lumber. It is furnished in either ¼ in. or ½ in. thickness in any size not exceeding 4 ft. wide and 10 ft. long. The claim is made that this material is practically waterproof and can be used as a wallboard or plasterboard. We understand that any reader of THE BUILDING AGE who is interested in this new material can secure a sample of it by addressing Mr. Toomey as above.

The Incinerite

One of the helpful conveniences which modern efficiency is gradually bringing into favor is the Incinerite manufactured by E. C. Stearns & Company, 114 Oneida Street, Syracuse, New York. The advantages of destroying by incineration wet or dry animal or vegetable garbage and refuse, waste paper, sweepings and collections of all descriptions is obvious, and the company is prepared to furnish architects or builders with blueprints showing various wall type installations, together with full information regarding all matters in connection therewith. The Incinerite burns either artificial, natural or gasoline gas.

Automatic Sashholders

An automatic sashholder designed to replace sashwork, cord, pulleys, balances, etc., is illustrated and described in a folder being distributed by the Hardware Sales Co., Inc., 46 Church Street, New York City. This device is said to be indestructible, being made of specially manufactured piano drawn wire springs, galvanized, and metal that is reinforced where the strain occurs. It is adapted for use in light and heavy windows, shut-

(*Continued on page* 34)



This barn, owned by Jesse V. Wise, Van Buren County, Michigan, U. S. A., has 22 single sliding doors and 4 double sliding doors, hung on 30 pairs of

Richards-Wilcox Barn Door Hangers

EASY TO PUT UP—HARD TO BREAK DOWN

Strong. Convenient. Bird-proof. Storm-proof. Adjustable aprons. Made to carry doors weighing 200 pounds to 2000 pounds. Cannot jump the track nor break off in the wind.

Sold by the best hardware trade everywhere

Richards-Wilcox Manufacturing Co.

SAN FRANCISCO LOS ANGELES NEW YORK CHICAGO

AURORA, ILLINOIS, U.S.A.

Richards-Wilcox Canadian Co. Ltd. London, Ont.

PHILADELPHIA MINNEAPOLIS BOSTON ST LOUIS

"A hanger for any door that slides"



A roof is as old as it leaks

Patches and repair bills proclaim the age of a roof.

Some are worn out at five.

RU-BER-OID is often youthful at twenty.

You can afford to pay a little more for RU-BER-OID. It gives such long-life service; it costs so little for repairs.

Ask your dealer to show you RU-BER-OID in Slate Gray, Tile Red and Copper Green.

REAL RU-BER-OID has the "Ru-ber-oid Man" on every roll. He's a guarantee of long wear.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete



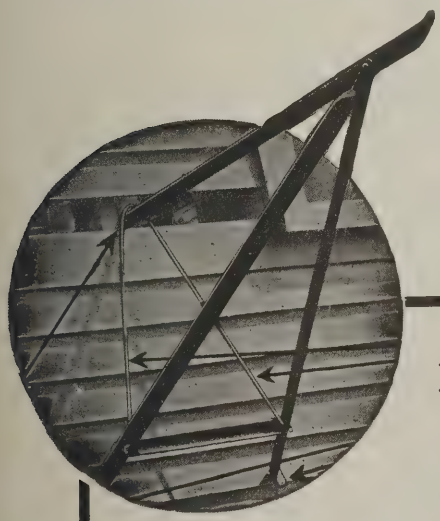
Pronounced "RU" as in RUBY

RU-BER-OID ROOFING

COSTS MORE - WEARS LONGER

MADE BY THE STANDARD PAINT COMPANY, NEW YORK BOSTON CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid



Hundreds of Satisfied Contractors

have testified that a "Trouble-Saver" has saved them four times and over its original cost.

It will cut out all the useless expense and wasted energy connected with the old-fashioned wooden scaffold. You can do a half-day's work in ten minutes—no nails to drive—no bother with screws or bolts. Simply hook the bracket around the studding.

And the "Trouble-Saver" stays where it is put without any wobbling or tearing loose. The two legs hold it absolutely rigid. When you take it down, simply unhook the "Trouble-Saver" from the studding, fold it up, and load about twice as many to the square yard as any other scaffold.

The Steel Scaffolding Co.
Evansville, Ind.

Artistic Effect Combined with Permanency

This can be obtained by mixing mortar with the proper shade of color. It is important to be as careful in selecting the quality and shade of color as in the selection of the face brick used.

Clinton Mortar Colors

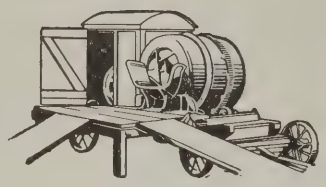
have been manufactured by us for nearly thirty-five years. During this period, they have shown absolute permanence of color and have given complete satisfaction in every particular. The result is that Clinton Colors have always had and have today, the reputation of being the best on the market.

We suggest that you send for a set of samples showing the various shades of Clinton Mortar Colors; also some suggestions as to the proper colors to use to produce the desired effects. A request for samples and prices puts you under no obligation to buy.

CLINTON METALLIC PAINT CO.
FRANKLIN AVENUE
CLINTON, NEW YORK



"The Standard" Low Charging Concrete Mixer



Cuts Costs—Increases Production

Contractors all over the country have found that "The Standard" Low Charging Concrete Mixer actually reduces concrete costs one-third.

Send for our latest catalogue, which is full of interesting pictures and data. Just write to our nearest office to-day for your copy. Ask for catalogue No. 48.

The Standard Scale & Supply Company

PITTSBURGH—1631 Liberty Ave.
NEW YORK—145 Chambers St.
PHILADELPHIA—523 Arch St.
CHICAGO—163 N. May St.
CLEVELAND—1547 Columbus Rd.
BALTIMORE—409 N. Gay St.



VAN GUILDER DOUBLE WALL CONSTRUCTION



Built Like a Thermos Bottle

with double monolithic walls from footing to roof plate, tied together and reinforced, and continuous air space everywhere.

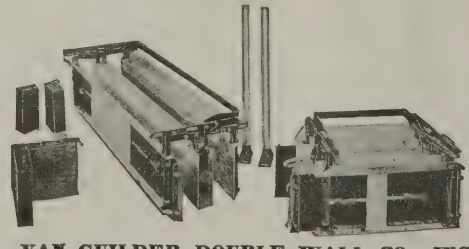
The Van Guilder Double Wall Concrete Machines

lower the cost of construction by eliminating the making and rehandling of materials, and economize on skilled labor.

The Immediate Releasing System permits the work to go on continuously—no waiting for concrete to set.

Our literature is packed with profitable information. It also shows the machines for building Ice Houses, Silos, Cold Storage Plants, etc.

Copies sent you on request.



THE MACHINE

VAN GUILDER DOUBLE WALL CO., INC.
20 Wagner Bldg. Rochester, N. Y.

ters, screens, etc., and in connection with private houses, public buildings, manufacturing plants, yachts, etc., or wherever sliding windows are desired. The device is said to be easily installed, it being simply necessary to mortise the side of the sash or frame, then to insert the holders and the window is ready for operation. It is claimed to save lumber, owing to the fact that solid frames without pockets can be used, and to also save time and labor. When installed it is invisible. The device is made in three styles and for sashes of various weights.

TRADE NOTES

Of interest to those concerned with painting is a recent issue of the "Dutch Boy Painter"—the monthly house organ of the National Lead Company, New York City. Some of the interesting articles contained therein are "Strategic Paint," which tells how efforts are being made to conceal things by the manner in which they are painted, such as horses, dummies, etc. An article entitled "Conditions Affecting the Life of Paint" is also presented.

The Federal Motor Truck Company of Detroit, Mich., has been making preparations for what is expected to be the biggest business in the history of the organization. Manufacturing facilities are being increased in order to meet the demand, and much more space has recently been added to the plant for larger stock rooms and more manufacturing room, particularly for radiator and bench assemblies. Several new service elevators have been erected in the factory buildings to facilitate every branch of production. Five hundred feet of additional railroad loading platforms have been constructed to serve new sidings, making it possible to ship trucks as soon as completed.

According to the North Bangor Slate Company, Bangor, Pa., the slate business this year has shown considerable improvement over the conditions existing for several years past. The high cost of building is apparently convincing the building public that when portions of the structure are expensive, it is a good plan to use a substantial roof covering and one that is at the same time fire-resisting. In this connection it may be stated the company is sending out convenient blotters for desk use and bearing upon their face some interesting information relative to "Genuine Bangor Roofing Slate." Attention is called to the durability, safety, economy and appearance of slate, and in connection therewith the company states that it produces "everything that is manufactured from slate." Those who are interested can obtain prices on blackboard and structural slate by writing to the address given.

A folder describing some of the virtues of oak flooring is being distributed by the Oak Flooring Manufacturing Association, Cincinnati, Ohio. Quotations from prominent magazines upon the excellence of this flooring are also contained. Grading rules for quarter-sawed oak flooring are given, together with an interesting table showing the percentage of increase of various articles, including labor, steel rails, machinery, mill supplies, coal, freight rates and other things, as well as lumber and oak flooring.

The July issue of "Doorways," the monthly house organ of the Richards-Wilcox Mfg. Co., Aurora, Ill., contains an article of pertinent interest to the trade in general, entitled "The War and Trade Conditions," which points out numerous features in connection with various branches of the building trades, especially with the steel market. There is also an interesting article

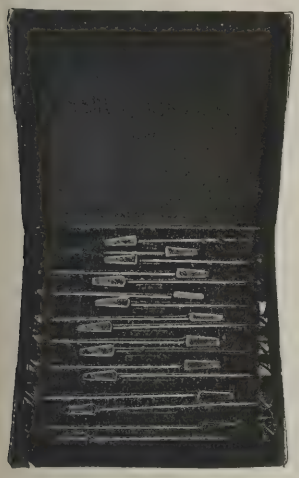
(*Continued on page* 36)

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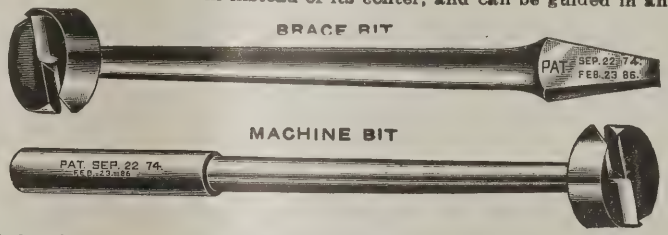
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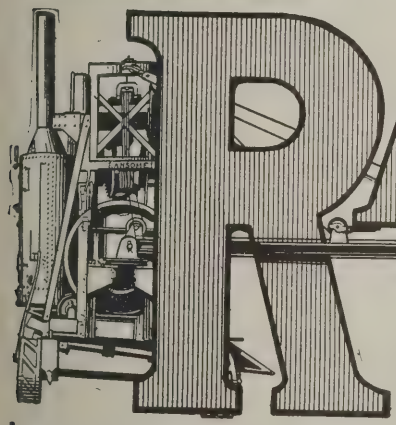
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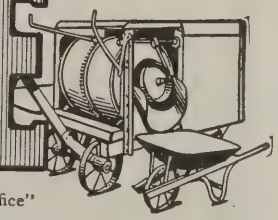


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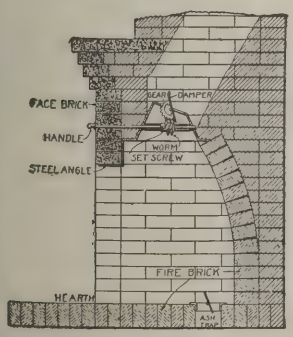
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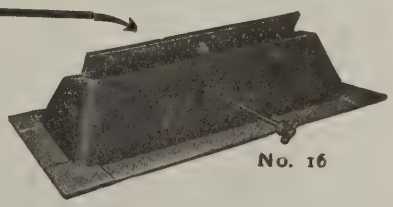
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entitled "Solving the Garage Door Problem," illustrated with halftones and line cuts, which is continued from the June number. The issue also contains a number of timely remarks and clever jokes. The issue is accompanied by a calendar bearing the picture of a pretty girl dressed in baseball costume, and illustrating the caption, "The Winning Pitcher." Upon the reverse side of the calendar is stated the applicability of this caption to R.-W. products.

The title of the Gage Tool Company, Vineland, N. J., has been changed to the Gage Tool Company, Inc., and John P. Gage, who was for many years proprietor of the company, has disposed of his interests to Phillip J. Leavens. The trade is well acquainted with Mr. Leavens from his connection with the tool business during the past thirty years as a successful inventor, designer and manufacturer of new tools.

The thatched shingle roof is one which is rapidly gaining in popularity the country over, and pictures of some of the attractive residences upon which they have been used are being distributed by the Creo-Dipt Company, Inc., 1030 Oliver Street, North Tonawanda, N. Y. The photographic reproductions are of good size, so that the various details can be clearly seen in the houses shown, including designs of a varied nature.

Walter Ramming, 3753 Fulton Street, Union Course, Long Island, N. Y., is desirous of securing copies of catalogs and other literature issued by manufacturers of builders' materials.

The Stanley Works is putting up a seven-story factory building to be used in connection with its plant at New Britain, Conn. This building is 65 ft. wide and 210 ft. long and will be provided with the most modern manufacturing equipment and facilities. It will be ready for manufacturing purposes about Nov. 1. It is alongside of and exactly like the manufacturing building the Stanley Works erected about a year and a half ago.

The Standard Paint Co., 588 Woolworth Building, New York City, has just brought out a new and complete set of waterproofing specifications of considerable interest to builders. One portion covers mortar facings for cellars, pits, etc.; another mortar facings for swimming pools, tanks, fountains, roofs, and other work sometimes subject to water pressure and sometimes to drying influences; another to waterproofing concrete in the mass and still another to waterproofing non-cracking stucco.

Grand Rapids Hardware Co., Grand Rapids, Mich., has been distributing an interesting catalog descriptive of its all-steel sash pulleys, for which strong claims are made. The various styles are illustrated, giving the builder a ready idea of their appearance, and in connection with them are prices, numbers and brief data covering salient features.

William A. Hart, formerly in the advertising department of the Burroughs Adding Machine Company, has joined the advertising staff of the Detroit Steel Products Company, Detroit, Mich., as assistant advertising manager.

A. A. Pauley of Cleveland, Ohio, the well-known inventor of concrete building blocks, has received word that the United States Government is using nearly $2,000,000 worth of these blocks in building homes in the canal zone.

A catalog illustrating and describing "Perfection" detachable screen door hinges is being distributed by the Hardware Specialties Company, Wabash, Ind. The builder who utilizes horses in connection with his business will be interested in the check holders, check loops, line guards, etc., which are also presented.

Containing Plans of This House; Also a Colored Supplement and Plans

Building Age

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SEPTEMBER, 1917

PRICE 20 CENTS



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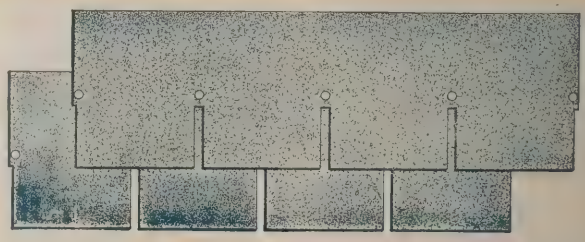
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The Building Age

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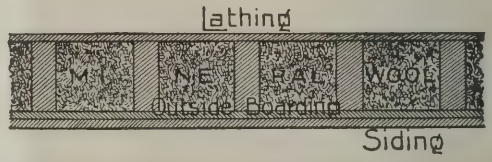
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Section of Sound-Proof and Fire-Proof Partition. Can be used for outside walls also.

BUILDING AGE

NEW YORK, SEPTEMBER, 1917

A Frame Cottage with Brick Veneer

Plans of a Compactly Arranged Nine-Room Dwelling of Moderate Cost

AN interesting example of brick veneer construction is the cottage located in the Lake region which we have taken for the subject of the present article. It is of attractive exterior as may be seen from an inspection of the half tone engraving upon this page, while the floor plans upon the following page clearly indicate the arrangement of the interior. On the main floor are living room, dining room, a den, kitchen, two bed rooms and a bathroom, while in the attic or second floor are three sleeping rooms.



A Brick Veneered Cottage Designed by Edgar A. Payne, Architect, Carthage, Ill.

According to the specifications of the architect the foundations and basement walls are of poured concrete, the mixture being in the proportions of one part Portland cement to two and one-half parts of sand and four parts of crushed limestone. The framing timbers are of pine, the first floor joists being 2 x 10 in., the attic joists 2 x 8 in. and the studs and rafters 2 x 4 in., all placed 16 in. on centers. The cellar is 7 ft. 3 in. in the clear, and the main story is 9 ft. 5 in. in the clear.

The outside walls are covered with shiplap sheathing and building paper. The first story walls from grade to cornice all around have a veneer of red pressed brick laid with close joints in white mortar, the brick being tied to the frame walls every sixth course by having 30d. cut casing nails driven into each stud. All door and window openings have the brick carried over by 4 x 4-in. steel angle irons.

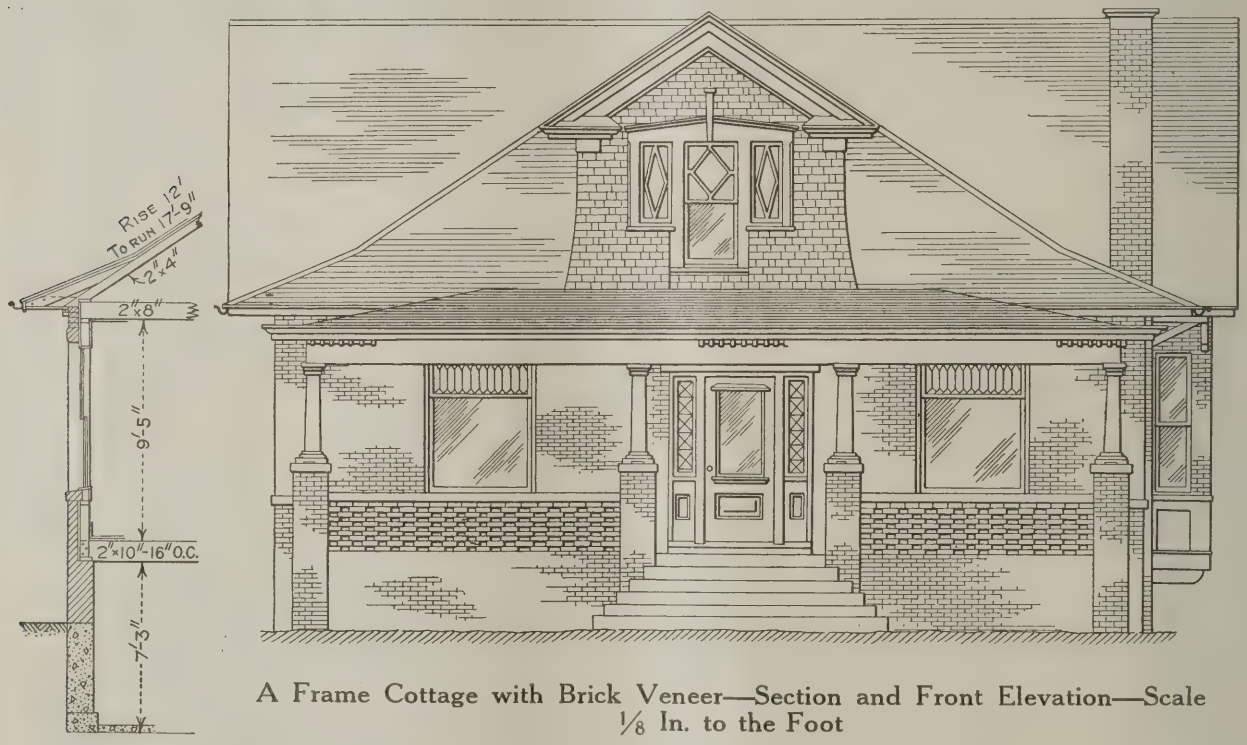
The second story and gables are covered with 6-in. segment butt shingles exposed 6 in. to the

weather. The rafters are covered with shiplap sheathing and building paper over which are laid 9 x 18-in. Bangor Ribbon slate with 3-in. lap.

The entire basement has a floor of concrete of the same mix as that used for the foundation walls and is finished with a top coat 1 in. thick consisting of one part cement to two parts sand. The floor is graded to the drain outlets.

The porch floors are of 5-in. concrete slabs, reinforced with half-inch bars placed 24 in. on centers and covered with heavy galvanized wire of 3-in. mesh, the finish of the floors being the same as the basement floor. The outside porch steps and the rear cellar steps are also of concrete finished the same as the floors. A very neat feature of the front porch construction is the lattice effect produced by the open brickwork.

The outside basement walls from top of the concrete to the top of the wall as shown by the section



A Frame Cottage with Brick Veneer—Section and Front Elevation—Scale 1/8 In. to the Foot

are built solid 13 in. thick. The porch walls are built in the same way, 9 in. thick. The ashpit in the cellar, the fireplace in the living room and the chimneys are of the same brick. The flues are lined throughout with brick on edge, the partition between flues being well bonded into the lining.

The coping of the walls of the front porch, caps of the porch piers, window sills and water-table course around the first story at the window-sill line are of Bedford stone dressed smooth. All door and window caps of the first story are of the same stone, rock faced.

The first story floors are laid double, the underfloor or lining of shiplap being placed diagonally to the joists. The finish floors of the living room, the vestibule, the den and the dining room are of 2-in. face 13/16 quarter sawed white oak, the strips running in the same direction in all rooms. For the balance of the first floor and for all of the second floor the material is 7/8 x 4-in. Southern yellow pine flooring. It was laid after the plastering had been completed, blind-nailed, dressed and polished.

The interior trim of vestibule, living room, den and dining room is quarter sawed white oak while the balance is of selected cypress. The beams of the principal rooms are veneered on built-up cores. All window sash are hung on balance weights, use being made of braided cotton sash cord.

The kitchen and pantry are fitted up in a thorough manner with cupboards, tables, etc., all as indicated on the floor plans. In the pantry is a pastry table with two portable tilting bins, arranged with a sliding pastry board. All closets throughout are well shelved and provided with medium-size wire wardrobe hooks.

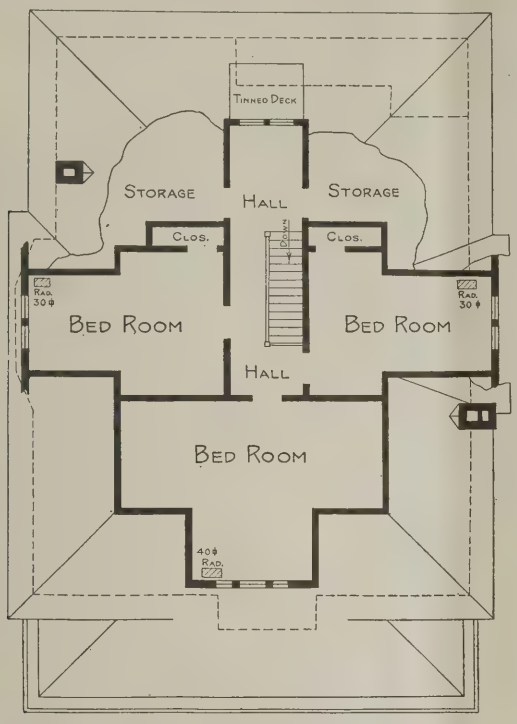
The hardware is of heavy wrought brass, old copper finished and colonial design throughout.

The outside painting was three-coat work of "Dutch Boy" lead and oil. The interior woodwork was properly filled and finished with Berry Brothers' "Luxeberry" wood finish. The oak floors were filled with Wheeler's wood filler and finished with two coats Pratt & Lambert's No. 61 floor varnish.

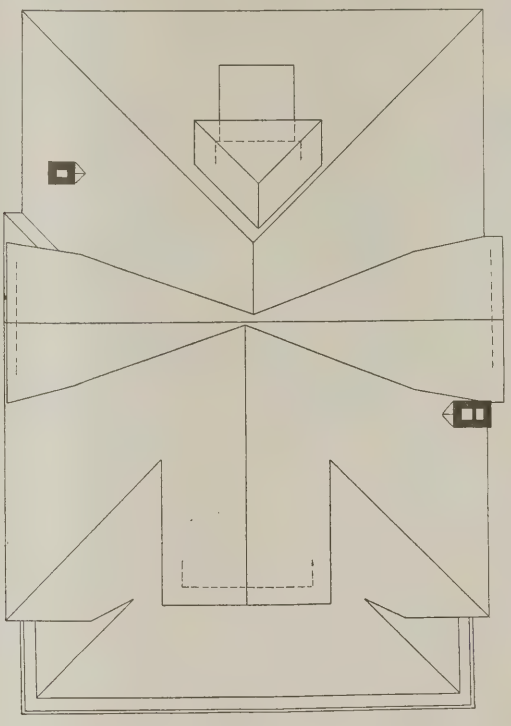
The cottage is heated by hot water on the Honeywell system, using a No. 4½ "Modern" hot water boiler covered with heavy asbestos cement. The radiation consists of 555 sq. ft. of "Rococo" radiation distributed and placed where shown on the plans. That in the living room, dining room and den consists of 6-column 20-in. radiation, while all other is 3-column 38-in. and neatly bronzed. The plumbing is complete, carrying city water from main in the street to two outside sill cocks, a hose bibb in the basement and the water closet in the bathroom. A steel pressure tank is placed in the

basement and supplied with soft water from a cistern, by means of a hand pump carrying water thence to all plumbing fixtures in the house. A 30-gallon galvanized steel range boiler is placed in the kitchen where shown and is connected to the range for heating water for service. The kitchen has a white enameled open sink with nickel-plated fittings, and in the bathroom are an open lavatory, a 5-ft. bathtub and water closet, all of Standard enameled iron and connected up in a workmanlike manner.

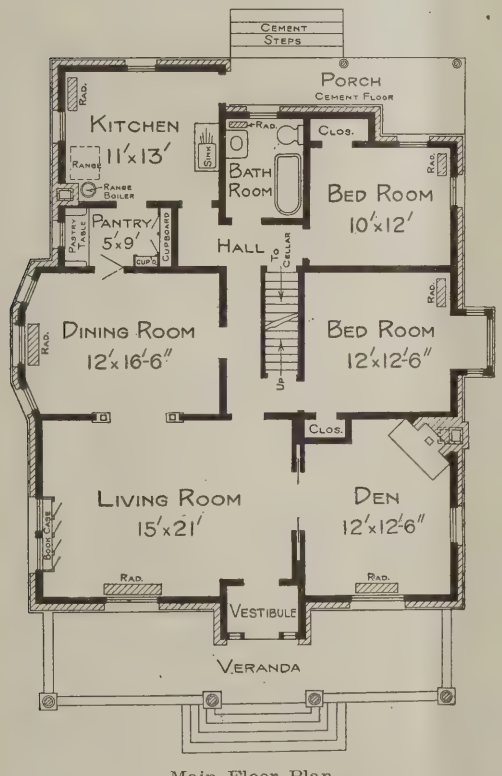
The cottage here shown was built by contract



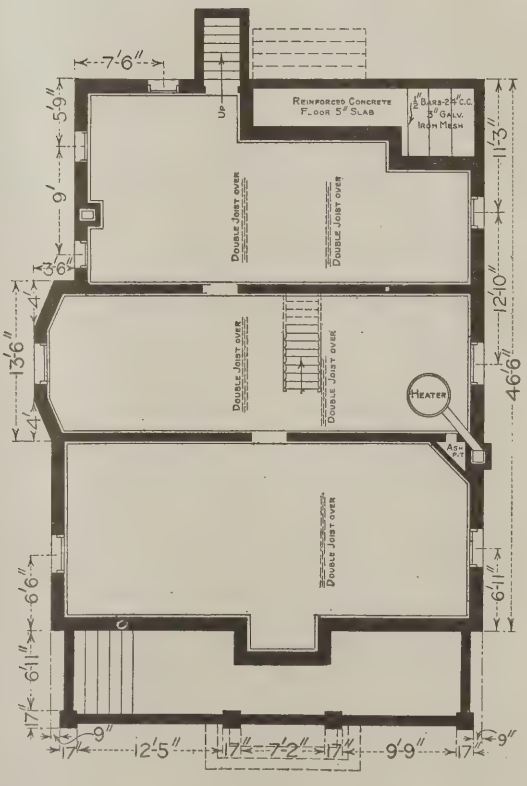
Second Floor Plan



Outline of Roof



Main Floor Plan



Foundation Plan

A FRAME COTTAGE WITH BRICK VENEER—FLOOR PLANS—SCALE 1/16 IN. TO THE FOOT

for J. M. McIntyre at Crosswell, Mich., from plans furnished by Architect Edgar A. Payne of Carthage, Ill. The owner pronounces it a most satisfactory home in every particular and costing about $3500 including heating and plumbing.

Speed in Delivering Building Materials

An indication of the speed with which building materials are being moved in connection with the army cantonments in course of construction in different parts of the country is contained in a report from the cantonment at Louisville, Ky. Administration buildings there were built from lumber cut in a Mississippi pine forest the week before. The trees were felled on Saturday, kiln dried on Sunday, loaded on freight cars Monday, and delivered at the Louisville site on Wednesday morning. An army of energetic carpenters completed the transformation from forest to Government building just one week from the day the trees had been felled.

Four of the biggest cantonments report that up to July 31 the following quantities of material were delivered:

Louisville, Ky.—Lumber, 1083 carloads; other materials, 149; total, 1232.

Petersburg, Va.—Lumber, 965; other materials, 431; total, 1396.

Ayer, Mass.—Lumber, 807; other materials, 532; total, 1339.

Fort Sam Houston, Tex.—Lumber, 934; other materials, 612; total, 1546.

To connect the cantonments with the nearest railroad line, and to supply facilities for the local movement of materials during the construction work, many miles of extra trackage have been laid at each site, at the expense of the railroads.

Finishing Birch in Mahogany Effect

In reply to a Missouri correspondent who wanted to know how to finish birch wood in imitation of mohagany the *Painters' Magazine* offered the following suggestions:

"Birch wood can be brought to an excellent mahogany finish, especially the black variety, which closely resembles cherry and is rather close-grained. It takes polish very well, but being rather light in color, must be stained. It does not require a paste filler, but should have two coats of shellac varnish over the stain and then be sandpapered. For a high-grade finish, two coats of rubbing varnish should be given, and these rubbed down, then a coat of finishing varnish, which admits of polishing. Use rotten stone and olive oil for polishing and clean off with alcohol."

The Care of Paint Brushes

A short time ago a correspondent of the paper presented some questions regarding the care of paint brushes, and as being of possible interest to him and others we take pleasure in presenting herewith copious extracts from an article on the subject taken from the *Dutch Boy Painter.* The suggestions contained in the article are intended to serve in aiding painters to keep their brushes in good condition.

New Brushes Not at Their Best

When brushes are new they are not at their best, for no matter how carefully they are made there are always loose hairs and dust present. By rolling the brush handle between the hands with the bristle end down, much of this dust can be shaken out and the loose hairs which then stick out from the brush can readily be removed. Then the brush can be roughly curried by passing the bristles across the edge of a dull knife held tightly against the bristles as they are squeezed through the hand. Whatever precautions are taken to clean new brushes, it is always best to break them in on outside work before attempting to use them on varnish or enamel work, as the presence of even a small amount of dust or loose hair will spoil such work.

Treatment of New Brush Before Using

Before using a new round pound brush or any brush in which the tightness of the bristles in the binding depends on the tightness of the handle, it is a good practice to part the bristles, pour a little water into the throat of the brush, and let it stand for an hour or two, brush end up. This method is to be preferred to the practice of setting the brushes in a tub of water. Only enough moisture is required to bring the handle back to normal size and a prolonged soaking is likely to swell the handle enough to affect the set of the brush, stretch the binding, and in this way affect its lasting qualities.

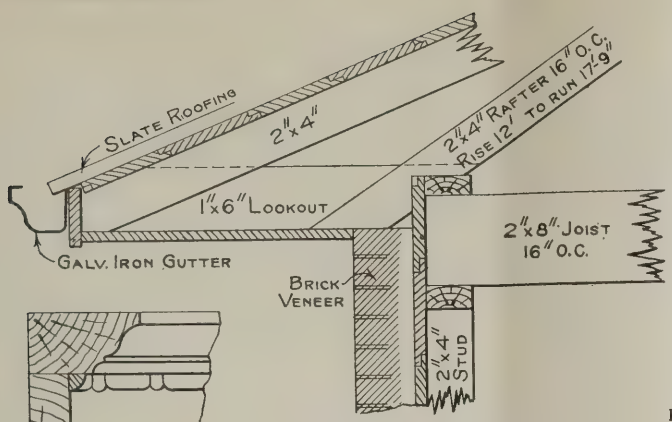
New round brushes, such as pound brushes or sash tools, should always be wrapped before using. This "bridling" may be done with twine or muslin cloth as follows:

Wrapping or "Bridling" Brushes

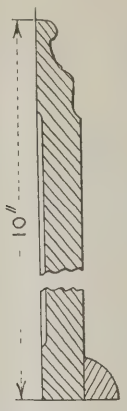
Holding the brush in the left hand, handle outward, take about 5 ft. of strong, stout cord, and about 9 in. from one end make a small loop (not a knot), which is held by the thumb against the side of the brush just where the ferrule touches the bristles. The short end of the cord is held in place by drawing it slightly into the end of the brush.

The long end of the cord is wound around the brush, care being taken that the successive turns make a smooth, solid coil. When the coil is wide enough draw the loose end of the cord, resting in the brush end, back through the loop that was held under the thumb. Draw the under part of the cord snug downward and the outter part snug upward. That holds the coil firmly in place on one side.

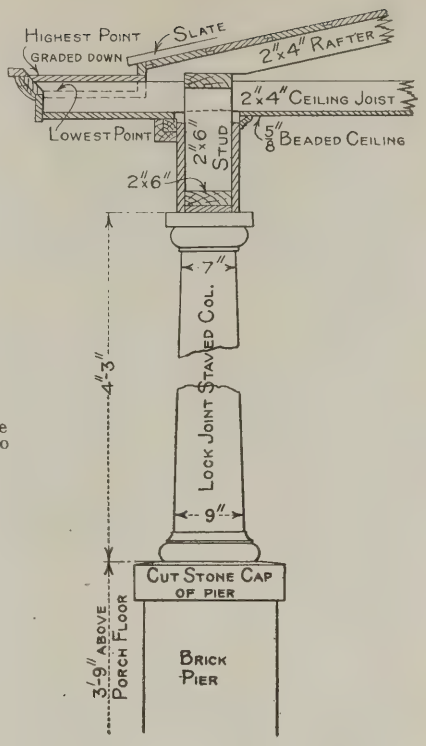
Now take the other end of the cord and on the side of the brush opposite the loop made at starting make another loop by turning the cord backward and taking one turn around the brush. Draw the free end through the loop, pull it snug, then tuck



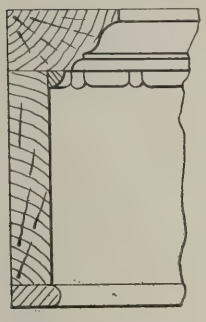
Details of Main Cornice—Scale ¾ In. to the Foot



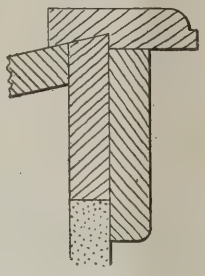
First Floor Base —Scale 3 In. to the Foot



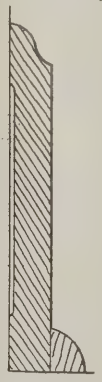
Details of Front Porch Cornice, Column and Pier—Scale ½ In. to the Foot



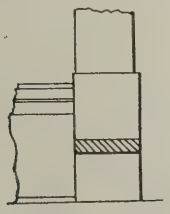
Detail of Cap in Second Story — Scale 3 In. to the Foot



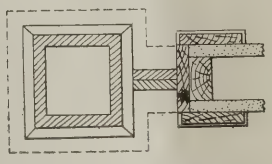
Detail of Window Stool and Apron—Scale 3 In. to the Foot



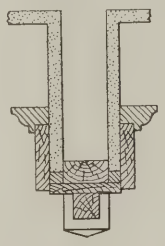
Base in Second Story — Scale 3 In. to the Foot



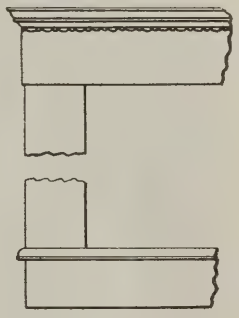
Base and Finish at Doors—Scale ¾ In. to the Foot



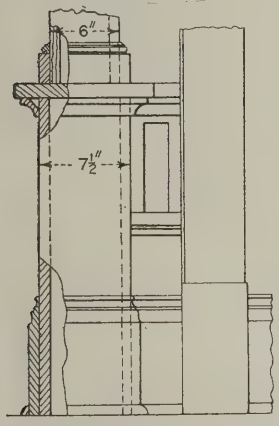
Horizontal Section on Line C-C of Colonnade Opening—Scale ¾ In. to the Foot



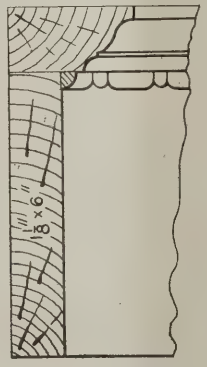
Section on Line E-E of Elevation of Colonnade Opening —Scale ¾ In. to the Foot



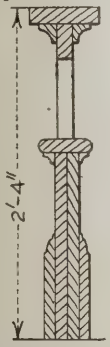
Detail of Window Casing — Scale ¾ In. to the Foot



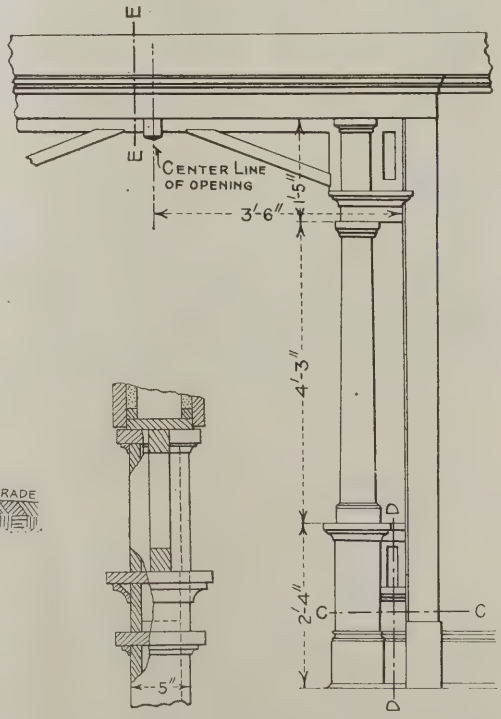
Partial Elevation of Colonnade Between Living and Dining Rooms—Scale ¾ In. to the Foot

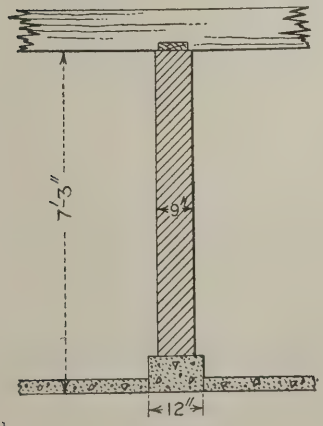


Detail of Cap on Main Floor — Scale 3 In. to the Foot

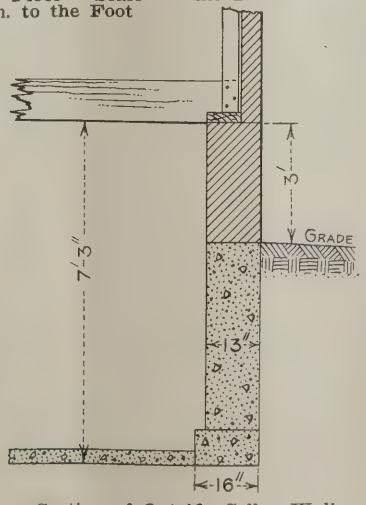


Section on Line D-D of Colonnade Opening—Scale ¾ In. to the Foot





Detail of Partition Wall in Cellar—Scale ¼ In. to the Foot



Section of Outside Cellar Wall —Scale ¼ In. to the Foot

Detail Section of Column — Scale ¾ In. to the Foot

Detail of Colonnade Opening Between Living and Dining Rooms—Scale ⅜ In. to the Foot

MISCELLANEOUS CONSTRUCTIVE DETAILS OF FRAME COTTAGE WITH BRICK VENEER

it under one or two turns of the coil and bring it up toward the handle.

Completing the "Bridling"

The two free ends of the cord may now be joined and knotted firmly around the handle; or, better still, two tacks may be put into the shoulder of the brush and the cord ends may be neatly fastened to these.

The bridle on a new brush may be drawn tight and loosened up afterward if thought necessary.

In breaking in round brushes, the aim should be to secure an even bevel on each of two opposite sides of the brush. Otherwise the brush will wear to a point and be an inefficient tool. Avoid poking if possible, as it tends to make a brush stubby, spoils the bevel and causes the bristles to cross.

Only a careless painter will leave his brush standing in paint overnight. Besides gumming the brush up, the bristles are more or less bent, and the brush does not work well till after it has been used for some time the following day. A badly gummed brush does not carry the proper amount of paint and will splash and spatter about as much paint as it spreads.

How Brushes Should Be Cleaned

It is a good rule that brushes must be cleaned with turpentine or benzine every night when they have been used in oil paint, and all kalsomine and water paint brushes must be washed out in water and hung up to dry. The methods for keeping brushes in good condition are similar. The brushes are usually hung on nails driven in the sides of tubs partly filled with water, turpentine, or raw linseed oil. The nails are driven at a height to allow the bristles to be covered for about two-thirds of their length with the liquid, but in no case must the brushes rest on the bottom of the tubs. When water only is used, care must be taken that the binding is not covered, as the water is likely to swell the handle and rot the binding. Some painters fill the brush tub with water so it will cover the brushes for about two-thirds the length of the bristles and then pour linseed oil on top of the water. Another way is to use about two-thirds turpentine and one-third linseed oil. Undoubtedly raw linseed oil is the best liquid in which to suspend brushes. It neither swells the handles, rots the bindings, nor damages the bristles, but it is likely to be rather expensive. If it is nobody's particular business to see that the oil is frequently changed and used, it becomes fatty and deteriorates so that it cannot be used for paint. In any case, the oil gets discolored and can be used only for dark colored paint.

Taking Gum from Brushes

Liquid paint or varnish remover that is free from caustic and alkalies is the very best thing to take the gum from a brush. If a brush has been used in a color containing turpentine, naphtha will not clean it properly. Turpentine, benzine or kerosene should be used. Another way to free brushes from gummed paint is to hang them in very hot vinegar and afterward wash them out with benzine.

If paint gets hardened in a brush, one way to soften the paint and free the bristles is to first soak the brush in raw linseed oil for twenty-four hours. Next put the brush in a pot of benzine and after a while work the bristles until you get them separated, when the paint will soften so that it will wash out. Fibre brushes may be soaked in soda water and when soft washed out with soap and water and rinsed clean. The caustic which would destroy the life of bristles does not affect fibre.

When Brushes Are Put Away for a Long Time

Whenever brushes are to be put away for any considerable time, they should be thoroughly cleaned and stored where it is cool and damp enough to prevent shrinkage of the handles. Many painters, after thoroughly cleaning their brushes, work a heavy lather of mild soap into them before putting them away, and find them in prime condition when they again want to use them.

However carefully brushes are kept and cleaned, they will not last long or give satisfaction if they are not used with equal care. When a brush has been hung in linseed oil it is very necessary to work the oil out of the brush, as otherwise the brush will leak and splash. But it should be worked out carefully. Give the brush a few quick flirts in the air and most of the liquid will fly out. The rest can be quickly and easily worked out on a board or the edge of the pot.

Making Paper Flame-Proof

A liquid that resists the action of fire and water, and renders all inflammable materials absolutely fireproof, has been perfected in the pharmaceutical laboratories of the University of Iowa. When wood, cloth, or paper are saturated with it, and then dried, explains the *Popular Science Monthly*, an insoluble mineral material is left in the cells of the fiber which makes combustion impossible. The drying may be spontaneous, or, in the case of wood, may be done in a kiln. As a test, a block of wood which had been soaked in the new preparation and afterward dried resisted the flame of a Bunsen burner for one hour, whereas a similar block of untreated wood was burned to ashes in exactly nine minutes. The flame of a Bunsen burner gives a much greater heat than an ordinary fire—from 700 to 1000 deg. Fahr.

The Hill of Troy is said to cover the ruins of seven towns one above the other, containing a continuous record of man's progress from the late stone age, about 4000 B. C., to the height of Greek civilization. In the second town, which was burnt down about 2500 years B. C., bricks were used, the clay of which they were made being mixed with a quantity of straw.

Comments on Wall Board Interiors

Why Some Wall Board Interiors Appear to so Much Better Advantage Than Others

By Joseph A. Poesl

THIS is not a plea to the reader to use wall board, because more of it is being put on walls and ceilings now than ever before. It is a plea to use it right when he does use it.

We all know that most new things are strongly prejudiced against when they first come out, and have a hard job to become established. It is the same old story over and over. Take the locomotive, for example. The public would not accept it for many years after its inventor had died in want. But the few far-sighted men who saw its great possibilities in time forced them—the public—to recognize and appreciate these same possibilities and success quickly followed.

So with wall board. There was a time when nine out of ten carpenters and builders were so prejudiced against it that they refused to apply it. The early struggle is passed, but it may require some years yet before the wall board industry attains the height of popularity where it can feel its product has become a staple commodity as a building material. I refer to the time when builders shall use it as they now use lath and plaster. I do not mean to imply that lath and plaster shall have gone into disuse, because I believe that both wall finishes will have found their respective fields of usefulness in the building world. Each will then be used where it will give the most and best service possible, and only there.



Interior of an Automobile Salesroom Having Artistic Wall Board Treatment

To my knowledge, misapplication is the only real reason for unsatisfactory wall board jobs, except in the case of the inferior wall boards which are

inherently faulty. Frequently, misapplication is the result of deliberate disregard of the manufacturers' instructions. In the early days when wall board was just appearing on the market, I saw carpenters pick up these instructions, read a few lines and throw them aside with the remark that they were never intended for carpenters, but were only for amateur craftsmen! Every carpenter who has had any experience with putting up wall board knows there are certain ways in which it can be applied, and also ways in which it cannot.

The Proper Use of Headers

A most important feature in wall board construction, usually played up strongly in the manufacturers' instructions, is the proper use of headers. Yet, time after time, upon investigating work that had caused complaint, I have found them left out entirely. It has always been beyond my understanding why a carpenter, worthy of the name, does a thing like this when he never dreams of putting up a 3/16-in. panel of wood, half the size of a regular panel of wall board, without a firm and rigid framework to which to secure it on all four edges.

This fault, fortunately, is gradually disappearing principally due to a better understanding of the characteristics of wall board brought about by the intensive educational work carried on among the carpenters by the manufacturers. More important just now are the "little big" things, not quite so apparent perhaps, but which subtly affect the appearance of the wall board interior.

Bad Effect of Small Decorative Strips

Often I have stepped into a room finished with wall board which struck me as being uninviting, poorly decorated and stilted, only to find upon analysis that the whole effect was produced by the small and undersized decorative strips. It is, indeed, remarkable what a strong influence the size and character of these strips hold over such a room. Of course, small strips have their place, as have large ones. It is easy to see the inconsistency of using $\frac{3}{8}$ x 2 in. decorative strips on a ceiling 20 ft. high, or $\frac{3}{4}$ x 5 in. on the walls of a small bedroom.

Care Should Be Exercised in Putting on the Woodwork

On account of the greater quantity of woodwork used in a room finished with wall board, special care should be taken in putting on the woodwork. The joints should be well made—so well, in fact, that an outsider who has never before handled a hammer and saw could not say that he could make just as good a job of it. Poor workmanship in this respect can mark an otherwise satisfactory job as a failure.

The importance of applying wall board in accordance with well balanced, symmetrical and appropriate panel arrangements is evident from the fact that most makers maintain, at no small expense, free service departments for the purpose of assisting those who are interested in using their product, in the proper planning of panel arrangements. Nevertheless, there are many who strangely neglect this factor of good wall board construction, probably because it is bothersome to send plans away for panel arrangements, or it takes too much time to do it themselves, or it is a matter of indifference to them.

Working Up Panel Arrangement

However, to those who would desire to work up their own panel arrangements, I might say that these should first of all be composed of panels of such sizes to accommodate the spacing of the studs and joists. They should be adapted to the functions of the rooms: a plate rail frieze in the dining room, for instance. They should be in keeping with the sizes of the rooms: usually large panels for large rooms and small panels for small ones; also, long panels for low rooms and short ones for high rooms.

This, however, is information that can be only generally adapted, there being so many other factors to be taken into consideration that the safest method to follow is to use a little judgment and common sense, and go to it. A common saying is the best way to learn to walk is to walk.

Two Typical Examples of Panel Work

Two typical examples of the effect of panel arrangements upon the appearance of rooms finished with wall board are shown in the illustrations. Despite the fact that small panels are used on the ceiling of the automobile salesroom, it is a fine looking room. Notice how carefully the panels have been spaced around the skylight; how nicely the lighting fixtures are centered exactly in the panels, and how well the wall panels are arranged in keeping with those on the ceiling. The room is comparatively high, but the small panels have the tendency to produce the effect of lowness.

Now take the lounging room of a motor boat club, which is shown in the other illustration. It is a good example of careless designing. The more obvious defects are the locations of the light-brackets on the wall, and the unexplainable use of narrow and wide panels on the one wall. In the former no attention, whatever, seems to have been paid to the arrangement of the panels, and in the latter there was apparently no attempt made toward symmetry.

Proportions of a Room

It might be instructive to note the proportions of this room: long, narrow and high. Then, according to good design, the ceiling panels should extend in one unbroken length across the room to make it appear wider. On the walls all the vertical panels should be medium width, and run only from the floor to the frieze line. The frieze itself should be made up of long panels. By this treatment the ceiling would be apparently lowered and the entire room shortened. Thus it would be brought into better proportion.

An inexcusable carelessness one comes across too

often is flat head nails instead of brads driven in the center of panels. They cannot be countersunk without spoiling the panels, and are very unsightly even when they have been painted over. When one considers that all wall board is decorated by painting, this creates the impression of an amateurish trick. No carpenter would ever neglect to use small-headed nails and countersink them in any piece of woodwork which he knows is to be painted or otherwise finished. He should not forget that wall board should receive the same handling as finishing lumber.

The decorator is sometimes a bit negligent in the selection of suitable color combinations for wall board jobs. He might counter by saying that it is his duty to carry out the desires of his client. If this were wholly true, he certainly has missed one of the fundamentals of his calling, just as the engineer would if he were to allow his client to turn over a lot of building material and say he wants a skyscraper of a certain design built of it. No, it is up to the professional man to direct his client as to what he should buy, to offer him advice and suggestions so that his ideas and tastes may be carried out to the fullest practical extent.

Then, too, as has been iterated and reiterated many times before, it is well to bear in mind that dark rooms should be decorated in light colors, and vice versa; that north rooms be given warm colors and south rooms cool colors. Also, they should be decorated according to their respective functions. A dining room would certainly have a different treatment from that of a bathroom. And this is a matter which should be followed in the same way as the architect goes to great pains to design his churches so the moment you see them you realize they are churches and not factory buildings.

These, then, are the things to have in mind when you do your next wall board job. The better results thereby produced will not harm your reputation; they will mean more satisfied clients, and *they* are the best advertisements in the world.



A Room in Which the Paneling of the Wall Board Is Faulty

In connection with the efforts which are being made to bring the cost of building down to investors' level, it is interesting to note the opinion of Cass Gilbert and other prominent architects to the effect that construction of the old-style semi-fireproof type should be carried on during the shortage of steel for building purposes.

Types of Workmen's Houses to Build

Comparison of Cost of Different Varieties —A Design Evolved Through Experience

THE treatment of the exterior of workingmen's houses will probably always remain a most important question," said architect Perry R. MacNeille, in a paper entitled "What Types of Houses to Build," which he presented at the annual convention of the National Housing Association, held in Providence, R. I.

The Artistic Vs. the Practical

"We had occasion recently to design the houses for the new village of Kistler, in Pennsylvania, and among the different types that we planned there were three in which the practical was made of secondary consideration to the artistic. The cost of all of the houses was the same and the community was one of workingmen so that we feared that the more cramped accommodations of the artistic houses would cause them to go begging. Quite the contrary proved to be the case, however, and of the three most popular houses in the village two of them were of the artistic type. When some of the tenants were asked why they preferred these houses, they said it was because they were 'so cozy and homelike.'

A Popular Style of House

"There is a style of house that has been worked out by successive alterations and improvements as the result of the criticisms of different factory managers and tenants. It was first designed for Neponsit Garden Village, East Walpole, Mass., and then, with successive modifications, for the New London Ship & Engine Company, Groton, Conn., for the new village of Kistler, in Pennsylvania, for Waterbury, Conn., and lastly for Rome, N. Y. It is two stories in height, has a central hall and stairs, with two bedrooms at the left and one of them equally available for a parlor. At the right is a combined living room and kitchen. Upstairs there are two bedrooms, a bathroom and attic space. There is a cellar under half of the house and hot-air heat. The exterior is a modification of the familiar New England type of house with gable roof, a porch across the front with high wooden columns and a rear service porch. This house has met with the requirements in cost, has proved popular with the tenants and has an artistic appearance.

Fluctuations in Price

"The fluctation in price between different sections of the country is continually varying, due to local conditions. Our own experiences based on last year's conditions are:

Comparison Between Costs in New York and Elsewhere

These percentages are based on an operation of $30,000 or more.

	Per Cent
New York	100
Waterbury	95
Bethlehem, Pa., Bridgeport, New Haven, Springfield, Worcester, East Walpole and Boston	90
Pittsburgh and Scanton	73
Wilkes-Barre, Easton, Allentown, Hauto, Baltimore, Pottsville, Minersville and Akron	70

"We once made a comparison between the cost of six different types of construction. With the exception of the first type, the difference was entirely one of the material for the outside walls.

The Summer Cottage

"The first type was that of the summer cottage: A small cellar and foundations of wooden posts, a wooden frame exposed on the interior, partitions of 7/8-in. boards, outside walls of sheathing boards covered with paper and shingles, a bathrom, but no plastering or heat.

"The second type was the usual form of wooden construction, with clapboards on the exterior, a cellar, plastering, a bathroom and hot-air heat.

"The third type was similar to the second except that the outside walls were built of tex-faced hollow tile blocks, the blocks exposed on the exterior and the plastering applied directly to the blocks on the interior.

"The fourth type had the usual hollow tile blocks instead of the tex-face and these were covered with stucco on the exterior.

"The fifth type was of frame construction veneered with common brick.

"The sixth type was of tile block construction veneered with common brick.

Using First Type as Basis of Comparison

"If the cost of the first type is taken as a basis of comparison the increase in cost for the remaining types was as follows—that is, houses built of the second type of construction cost 15 per cent more than those built of the first type. The third type cost 13 per cent more; the fourth type 16 per cent more; the fifth type 17 per cent more; the sixth type 18 per cent more. The masonry construction either of tile blocks or brick veneer costs so much less in repairs and painting that a tile block house covered with stucco would save its additional cost over the frame building covered with clapboards in less than two years."

Cozy Homes for the Countryside

Three Houses Well Adapted to Picturesque Sites and of Moderate Cost

THERE is a certain subtle attraction which surrounds the country home with a glamour that draws a city man as a bright light does the moth. A bewitching vision of climbing honeysuckle, rose bushes, lilacs and wisteria surrounding a house that nestles under the widespreading branches of stately oaks, seemingly a growth of the soil rather than an exotic creation of man, all contribute to form an ideal setting for the jewel of his fancy. When the proud owner shows a picture of his country home he wants it to be a visualization of the home-building instinct dormant in every man and to successful completion, no matter how impossible the problem. Few prospective owners take into account the fact that their house will stand clear and bare until kind Nature takes a hand and adorns the work of man with her green-leafed hand, as she has done with the old farmhouses of fanciful and haunting memories on which he has based his dream palace.

A bungalow which seems to partake of this ideal homelike spirit is to be found in Winchester, Mass., and is owned and occupied by W. H. W. Bicknell. As we look at the accompanying picture we feel its



The Cozy Home of W. H. W. Bicknell Picturesquely Situated at Winchester, Mass.

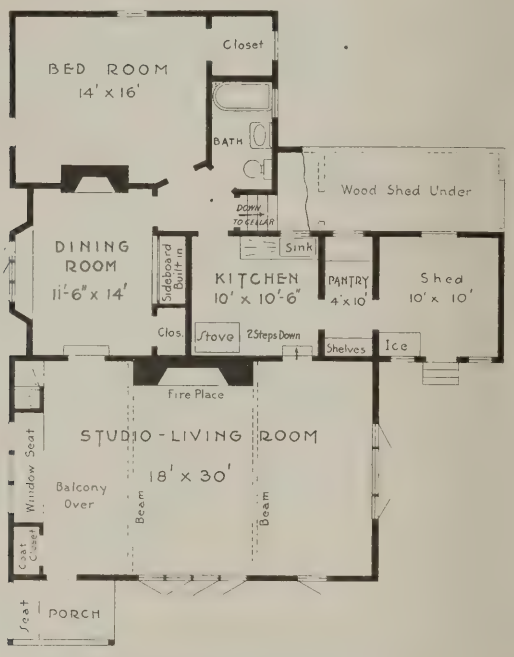
to express that personality and suggestion of memories with which his imagination affectionately clothes the dream home.

To meet this ideal of site—no more elusive than the fleeting fancy of the owner who one moment ardently desires a Dutch colonial and the next a bungalow, a Swiss chalêt, or a simple cottage—and adapt it to a chameleon-like plan which keeps pace with the exterior design, is a part of the arduous work that an architect and builder must bring

timid yet hospitable call inviting us in from a road which is evidently a real country road, with real live bumps in it, just the kind of road that make-believe country folks love for three months of the year and that real country folks swear at all the year round.

Over on the far side we see a valley whose leafy-topped trees the soft summer winds caress before lending their soothing aid to cool the house that stands in their path. The big casement window at

the end, supplemented by the small ones at the front, shows that here is the opportunity for full advantage to be taken of the cooling breeze. Such is the summer appeal of this site, but to many the shriller blasts of the winter hosts of Boreas breathe a fascination that excites and sends the warm blood thrilling a response through their veins.



Floor Plan of Cottage Shown on Previous Page—Scale 1/16 In. to the Foot

We enter the little porch, that is shingled, like the rest of the house, and make our way into the studio-living room, which sprawls its lazy length over the entire front of the house. A big wide brick fireplace containing the remains of last night's cheerful blaze strikes a response to our sympathies as we gaze over the room, perceiving the deer head with its widespreading antlers branching out from the skull, the rough unfinished ceiling so characteristic of the bungalow, and the walls rough-plastered up to the eaves. Between the massive looking 4 x 6-in. rafters are distinctly visible the sheathing boards which form the support for the shingled roof. The other woodwork is North Carolina pine, stained a yellowish brown, and wax finished.

Two 5 x 7-in. girders stretch across the room, one of them forming the balustrade for a balcony whose heavy timbers can be seen projecting their length 10 ft. over the studio-living room proper. An unusual yet attractive feature it is, for its bulk blends with and seems a part of the room, yet appears not to have robbed the latter to secure its place. We see at the right the big casement which attracted our attention from the exterior, and at the left its companion. Under our feet the dark waxed floor of North Carolina rift pine lends a subdued tone to the whole. The spirit is the homely



View in the Studio-Living Room of the Home of Mr. Bicknell, at Winchester, Mass.—the Open Fireplace for Burning Wood a Feature



ANOTHER COTTAGE PICTURESQUELY PLACED—THE SUMMER HOME OF W. P. HUBON, LOCATED AT DANVERS, MASS.



THE LIVING ROOM OF MR. HUBON'S COTTAGE, ONE END BEING USED FOR THE DINING ROOM

one of the country, evidently wooed and won by the attentive admiration of a woodland lover.

Through an open door we glimpse the dining room, finished somewhat the same as is the living room. Here the ceiling is plastered and the floor of hardwood stained to imitate dark walnut, while a deep yellow paper on the walls lends a soft warm glow to the room which verily furnishes most of the good cheer of man. A built-in sideboard is at the right, and at the left the wall shelters a large casement window.

An interesting feature, required because of the steep slope of the site, and one reminiscent of the old colonial days, when our grandfathers rambled from one height to another, are the two steps necessary for us to descend to the dining room and other rear portions of the house.



The Bradford Studio of "Arts and Crafts" at Magnolia, Mass.

Passing through the dining room and entering the bedroom, we immediately catch the clean, wholesome atmosphere that its white painted woodwork seems to exude. We know it must be this way even if we have no picture to spur our imagination.

The kitchen, which verily seems a room of doors, can be entered from the studio-living room, dining room, and the shed, which can be seen on the right of the exterior. The latter forms an entry to the pantry so that in winter cold air may not enter with the occasional visitor or tradesman. Hardwood, stained and shellaced, forms the kitchen floor.

The cellar is small, extending under the bedroom portion only, and yet it is large enough for all purposes of the household. A furnace promises seasonable cheer when the cold days come, and assures the house comfort the whole year round.

A home embodying somewhat different features is that of William Hubon at Danvers, Mass., a two-story cottage containing details which appeal to many. Its location in the midst of trees that shelter it from strong winds and sun sounds a call that makes one wish he were once again a tree-climbing boy, so as to be able to voyage adventurously to a precarious perch, lofty enough to secure a view over the tree tops when swayed by a strong wind, for a dim memory from the forgotten past tells us the picture would be one of a turbulent surging akin to an angry sea. If it were not for the house to be seen in the distance it would not be difficult to imagine that something larger than squirrels and jackrabbits were here to be found.

This house, however, like many others which nestle confidingly back in the arms of Mother Nature, is covered with shingles whose weathered surface blends with the enveloping shades and tones.

We enter. The living room speaks solid comfort, and its cheery welcome is such that we wish we were in reality, instead of in imagination, entering the door in the far corner to partake of the meal that is so evidently ready. The rough finish of the ceiling, which towers far above our heads, gives a big sense of the wholesome outdoors which the

entire cottage expresses, and this suggestion is well borne out by the jack o' lanterns and blankets which blend so naturally with the environment.

And what a quaint way to get to our bedrooms! The balcony, that extends part way around, is a charming place to stand in the morning and shout a cheery greeting to the assembled household. Wouldn't it startle them! And then we could dash from view and clatter down the narrow staircase to take our place at the table, even though our ears are assailed with "better late than never."

But country homes are not always far away in the woods, even though the city man may usually visualize them in such a location. Many a quaint New England street winds its stately way past a white-painted fence or low stone wall back of which stands a house disarming unfavorable criticism.

Such a home is the Bradford Studio, a year-round residence in Magnolia, Mass. Its shingled sides and colonial shutters, with the familiar crescent-shape saw-cut opening from windows which form an interesting variation from the usual set pattern. Some contain two, some six, eight, or even ten panes of glass, blending well with the rough field-stone wall and hewn carriage step.

The roof is peculiar, slanting lazily down on one side, while on the other a more energetic note is touched in the gambrel, whose lower slope rushes abruptly down past the two dormer windows to form a slight overhang. A potted bush hides the doorway, which can be seen peeping over its top.

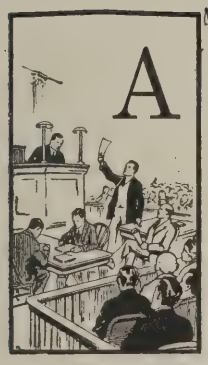
The porch presents an interesting idea easily applicable to other designs. One could well enjoy himself here on the uncovered space at the right in silent communion with old Father Sol, or when his attacks became too vigorous retire to the shady section of the porch. We observe the quaint sign, so typical of "Arts and Crafts" in New England, which is fastened to the square white post.

Each of these three homes breathes forth some of that spirit of which the home builder is in search, and yet each is saliently different. In each the problem of house and environment has been well solved. Equal thought and study should make other homes give forth the same spirit, so characteristic of the ideal cozy home of the countryside.

Building Agreements Interpreted

Review of Recent Court Decisions Affecting Architects and Builders in Important Matters

BY A. L. H. STREET



AMONG the recently decided suits arising in the building business and affording interest to architects and builders is the case of Kitchell vs. Crossley, in which the New Jersey Court of Errors and Appeals passed upon plaintiff's claim to compensation for services performed as an architect.

Plaintiff was employed by defendants to prepare plans and specifications for a building, it being agreed that he should be paid $1,500 therefor and for supervising construction of the building; $750 was paid when the contract was entered into and it was understood that $375 should be paid when the building was half completed and the balance on completion of the structure. Defendants never proceeded to the erection of the building and plaintiff sued to recover compensation on a basis of architects' customary percentage on the estimated cost of the building. He recovered verdict for $2,757.26 on this basis, in addition to the $750 paid under the contract mentioned.

On appeal, the Court of Errors and Appeals reversed the judgment, holding that the contract referred to limited plaintiff's right to compensation to the amount stated therein, $1,500, and that inasmuch as there was no performance as to the services to be rendered in supervising the building, although this was due to defendants' abandonment of intention to erect the structure, plaintiff was not entitled to recover more than the fair proportion of the $1,500, based on the relation of the value of the services performed under the contract to the value of all the services called for by the agreement.

Plaintiff's Right to Compensation Limited

A somewhat similar conclusion was reached lately by the Iowa Supreme Court in the case of Cammack & Son vs. Weimer. There it was decided that, under a contract limiting compensation for superintending the improvement of residence property to 8 per cent of the cost of labor and materials used in the work, the superintending builder was limited to that basis, and in suing for compensation was not entitled to show what was the reasonable value of the services rendered under the contract.

Incidentally, it is decided in the same opinion that defendant owner of the building, when sued for the agreed compensation, was not precluded from asserting that plaintiffs had not properly performed their duties, merely because he saw the

work progressing and made no objection to its character. On this point, the court said:

"It became their [the superintending builders'] duty to exercise that skill and learning which is required of one in that business in the neighborhood, and to give time and attention to see that the work was done substantially according to the plans and specifications. * * * Of course this would not be true as to changes from the plans and specifications made on the direction of the defendant or at his request. Such changes would not be subject to this rule; nor could the plaintiffs be holden liable for defects in the plans and specifications" [which plaintiffs did not prepare].

Contractor Bound to Correct Defects

In a North Carolina case—Shepard's Chemical Co. vs. O'Brien—the Supreme Court of the State holds that a clause in a building contract binding the contractor to correct and make good all defects arising or discovered in the work within two years after completion of the contract was properly interpreted as applying only to defects developing after the architect issued his final certificate of performance, and not to defects obvious at the time of the issuance of the certificate.

Relationship between a principal building contract and a subcontract was involved in the case of Soule vs. Northern Construction Co., passed upon by the California District Court of Appeal. Defendant contracted to construct a concrete garage for a third person, the contract calling for reinforcement by "steel bars, fabric stirrups, and tying wire." Defendant awarded a subcontract to plaintiff, whereby the latter agreed "to furnish and set in place in a workmanlike manner all reinforcing steel bars, tying wire, etc., * * * in accordance with the plans and specifications for the construction of said building." Under these circumstances, the court decided that plaintiff as subcontractor was bound to furnish all reinforcing material called for by the principal contract, although the subcontract was not as specific in its terms as the principal contract.

Completing Abandoned Work

The fact that a building contract contains no express provision authorizing the owner to take possession of and complete the work on the contractor's abandonment of his contract does not prevent the owner from doing so and holding the defaulting contractor accountable for any increased cost, according to a conclusion reached by the Iowa Supreme Court in the recent case of Schmidt Brothers Construction Co. vs. Raymond Y. M. C. A. of Charles City.

The court also decides that the owner, in exercising this right, need not submit the work of completing the building to competitive bidding nor do it at the lowest possible cost, in order to minimize the claim to be made against the contractor for failing to perform his contract. The owner discharges his full duty in this regard by expending such money for labor and materials as is fairly and reasonably necessary to complete the structure in conformity to the plans and specifications forming the basis of the broken contract.

Efficiency of Wooden Joints

Tests of the efficiency of various types of wooden joints were made during the past year by the Forest Products Laboratory maintained by the United States Department of Agriculture and about 3000 nail-pulling tests were completed on nails driven into twenty-five different species of American timbers. While the data have not yet been analyzed, it appears that the holding power of nails has a definite relationship to the density of the wood and that there is practically no difference in strength between a solid beam and a wooden beam of the same dimensions made of two planks nailed together.

Foreign Purchases of Woodworking Machinery

Consul General W. Henry Robertson, writing from Bueons Aires, Argentina, says:

"Most of the lumber used in Argentina is imported, the larger part from the United States. Spanish cedar and a little white pine are produced here, but in quantities too inadequate for the local demand, and large amounts are imported. The lumber from abroad is used for construction work, especially for flooring, ceiling and other interior finishing, doors and sash, and in the manufacture of furniture and fixtures, carriages, etc. This includes, in the order of their importance, yellow pine, spruce, white pine, Spanish cedar, oak, Douglas fir, ash and walnut.

"All the woodworking machinery used here is imported. It has been supplied principally by Germany, England and France. The imports from the United States have been very limited, although there appears to be no prejudice against American machinery. Its absence from this market probably is due more to a lack of special efforts by American manufacturers to extend their sales here.

"The most feasible way to operate here is through a resident agent who maintains a selling force to work throughout the country and keep constantly in touch with the local requirements. During the past two or three years, however, depressed financial conditions have prevented new establishments from being erected, and the older firms have installed very little or no new equipment.

"Any advertising matter intended for this country should be printed in Spanish. When sent through the mail to individual addresses no duty is charged, although when shipped in large quantities to one firm for distribution it is subject to a duty."

Representatives of the Redwood Lumber Manufacturers of California have just secured what is said to be one of the largest export contracts for wooden pipes ever placed. It calls for 2,800,000 ft. of 4 x 6 rough California Redwood pipe stave stock.

Some Echoes of the Noon Hour

An Interesting Talk by the Carpenter-Foreman in Regard to Hanging Doors, Etc.

By Edward H. Crussell

THE time was early spring. The gang (working on a block of detached residences in the suburbs) had finished lunch and were discussing a can of maple sap, which the kid (who was of a restless disposition and an experimental turn of mind) had drawn from the large tree on the rear of the lot, when the foreman joined them.

"While I think of it," said he, "and while I have you all together, I want to mention something before it's too late. In a few days we'll be putting the hardware on this job and I want it distinctly understood that no matter who is given the job of fitting the locks, he, nor anyone else, is not to attempt changing the bolts of them without positive instructions from me. I expect to do any necessary changing myself, but of course I may miss something, and then again, I have known men to change locks that didn't need changing and I am of the opinion that you'll save a good deal of time by taking it for granted that the lock is ready to apply when given you, and that if it isn't, the business of changing it is not yours, but mine."

"You never will be able to forget that fellow O'Reefe, will you?" chuckled "Old George" who had been with the firm longer than the foreman had, and who was a privileged character.

"Oh, well," grinned the foreman, "I suppose there are one or two of you who might be able to change a lock without making a mess of it, but I can't afford to take chances. Moreover, it's been my experience that the man who knows how, usually brings the lock to me, or at least tells me that it needs changing. It's the fellow that knows nothing about a lock who is the most ready to pull the lid off it to see what makes it work." And the foreman strolled off to the basement of the corner house to see what the plumbers had been doing to the floor joists.

"What's this about O'Reefe?" asked Shorty of Old George. "Who was he, what did he do?"

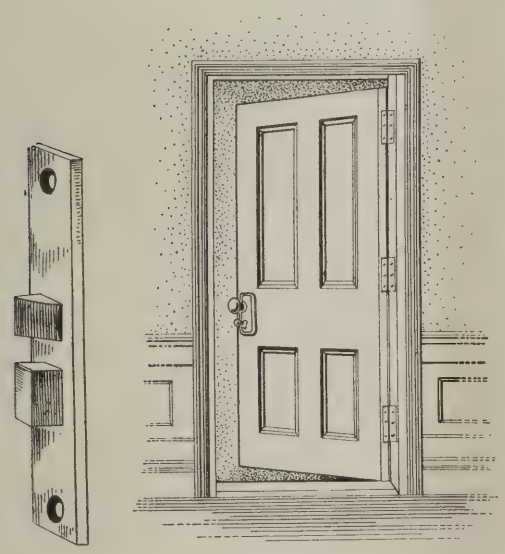


Fig. 1—A Right Hand Door and Its Lock

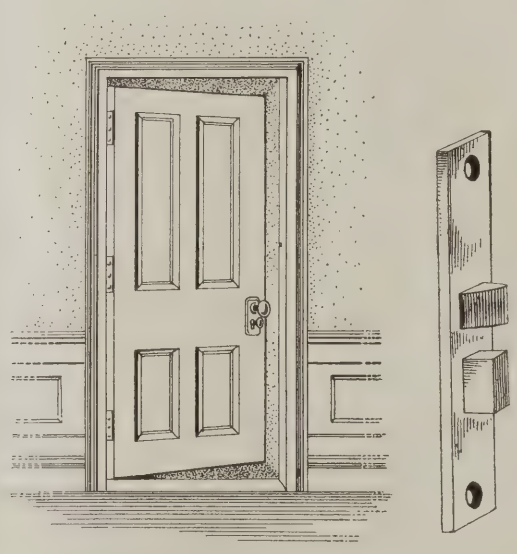


Fig. 2—A Left Hand Door and Its Lock

VIEWS OF DOORS ILLUSTRATING THE COMMENTS OF THE CARPENTER-FOREMAN

"A fellow in the form of a carpenter, who worked on that apartment house job we finished up last winter," was the reply. "I don't suppose he ever would have had a chance to fit one of those locks only for the fact that an extra doorway was put in after the job was started and the hardware for it did not arrive until the job was almost finished and all the real carpenters busy with something else.

"The accounts of what happened differ widely, but from what I could make out of the 'Old Man's' version (the 'Old Man' was the foreman who was at least ten years younger than the speaker) after

it had been properly censored, the facts were something like this.

Main Doors Fitted with Anti-Friction Locks

"All the main doors on that job were fitted with those anti-friction locks which, as most of you know, are non-changeable and have to be ordered right, or left hand to suit the door. It seems that it made no difference whether this particular door swung to the right or left, so to avoid any need of changing the lock, the 'Old Man' merely handed O'Reefe the hardware and told him to hang the door to suit the lock instead of blue-penciling the letter 'H' on the hinge edge of the jamb as he usually does in cases requiring it.

"O'Reefe's religion is, that unless there is something to prevent it, all doors should be hung right-handed, and as what few locks he had had to do with thus far were fitted with reversible bolts, he hung the door right handed and then started to change the lock.

What Happened to the Lock

"He had no sooner got the screw loose than the lock—like 'old Elder Maybee's powder' went off all at once, and scattered half a hat-full of springs and fixings among the shavings on the floor."

"I wonder how it happens that there always is a couple of feet of shavings on the floor whenever a fool lock takes a notion to jump apart," commented Shorty sagely.

"Yes," snapped Old George, who didn't like being interrupted, "the Old Man said that very same thing. That is, he said about the same words only he had 'em arranged different. He said, 'I wonder how it happens that a fool carpenter never thinks of taking a lock apart only when there's a couple of feet of shavings on the floor.'

"Anyway, O'Reefe hunted through the shavings and picked up all the pieces he could find, but when he went to put them together again they wouldn't fit. He either had too many pieces or too few, and in order to find out which, he takes a lock off another door. Of course, you won't believe what comes next, but the Old Man swears it's true and O'Reefe isn't here to deny it. The second lock flies to pieces like the first and when the Old Man arrives on the scene, here's O'Reefe pawing around on the floor among the shavings, and on the bench, the the cases of two locks and enough springs and fixings to build a popular style of automobile.

Reassembling the Lock

"They have a somewhat one-sided argument, and while O'Reefe departs to pack up his tools, the Old Man sets to work assembling the locks. I didn't see the inside of one of them, but they must have been somewhat complicated for he had to take off still another lock before he could be sure he had all the pieces and that they were all in their proper places. The only difference was that his lock didn't fly to pieces, which is perhaps one reason why he is a foreman."

"Well," commented Shorty, with a grin, "I wouldn't think of doubting your word, George, but that listens to me like the sort of tale to which a fellow has to say 'Truth is stranger than fiction.'"

Excess Parts After Lock Is Assembled

"You haven't heard the *truest* part yet," was the reply. "Old Man says that when he got all the locks together, he found that each was correct for its respective door and there had never been any need of changing any of them. O'Reefe had departed before this was discovered, and it was perhaps as well for everybody concerned that he had. Those who were there tell me the Old Man's comments were a liberal education in the use of bad English."

"What I'd like to know," said the kid, "is how do you tell which hand a door is. If you stand on one side of the door it opens to the right, if you stand on the other side it opens to the left; now what makes one door a right hand and the other a left hand?

Determining the "Hand" of a Door

"To tell the hand of a door," said George, "you must stand, or imagine yourself standing on the outside of it, or rather (seeing that there might be some chance for argument as to which is the outside of some doors) on that side of it from which you cannot see the hinges. Then the one that opens away from you to the right is a right hand door, and the one that opens to the left is a left hand."

"Here you are, Kid," said Scotty, who had been fumbling in his coat pocket, "here's a picture I cut from a catalog which shows the whole layout. Fig. 1 shows a right hand door and the lock that goes with it; Fig. 2 shows the same for the left hand."

"Speaking about it being some people's religion to hang a door a certain way," continued Scotty, "something like that must have been what was wrong with the fellow who hung the doors in the house in which I'm living. There are four doors opening into the kitchen alone, and every one of them, instead of folding back against the wall, opens out into the room; if you open them all at once, there's hardly room enough in the kitchen to stand a chair.

The Wrong Way to Hang Doors

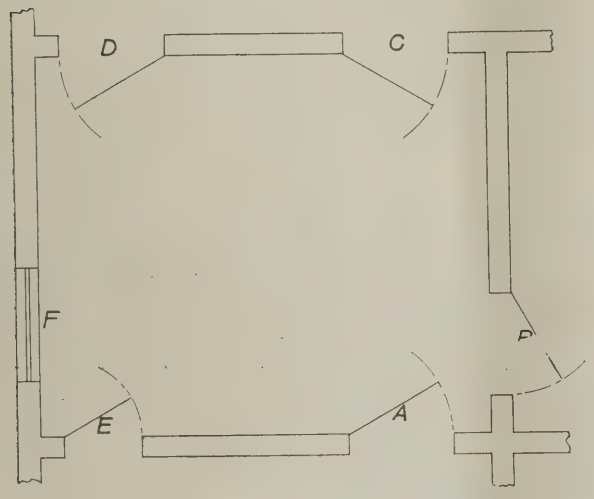
"The arrangement is something like this," and he drew Fig. 3 on the ground with the butt end of his pencil. *A* is the door leading into the kitchen from the hall. *B* leads into the back bedroom, *C* onto the rear porch, *D* into the pantry and *E* is the door of the hot water boiler cupboard.

"Every one of these doors is hung wrong. *A* should be on the other side of the doorway in the hall, *D* and *C* should be on the other edge of the jamb, so as to permit them to fold back against the wall out of the way and *E*, which at first sight may appear to be correct is not, because being what it is, it seldom requires to be opened and when it does, it should open so as to permit the light from the window *F* to enter the cupboard. As it opens now,

most of the light is cut off, not only from the cupboard, but from the kitchen itself.

"I spoke to the landlord about this matter and he was quite willing that I should make the changes, but when it came to a question of pay for the job, nothing doing. Now I couldn't see why I should charge a decent fellow, like the boss, the union scale for my services and do a couple of hours work for my close-fisted landlord for nothing, so my solution of the problem was to draw the pins from the hinges of doors *A* and *D* and store the doors in the basement until I get ready to move when I'll put them back again.

"These two doors have never been missed and since removing them, I've often thought that when I come to build that house of my own I'll save a little money on the job by leaving out all the unnecessary interior doors. It isn't a scheme that I feel like advertising, for a number of reasons, one of the reasons being, that if we take away the doors, we



An Example of Doors Incorrectly Hung

take away most of the romance from the carpenter's daily business."

"Speaking about hanging doors," said Shorty, "how many d———?"

"There goes the whistle," chuckled Old George, "and just in time to stop one of those yarns about the fellow who hung so many doors in one day that it took him all the next day to count them."

(To be continued)

Apprenticeship in the Building Trade in England

A new scheme of apprenticeship in the building trade has recently been unanimously adopted at a conference convened by the London Advisory Committee for juvenile employment between repsentatives of the Institute of Builders and of the Building Trades Organizations. The object is to regulate the method of entry into the trade and to provide proper means of training. All apprentices are to be bound for a period of five or six years. If, however, a boy has satisfactorily completed a two years' course at a day technical school where instruction is given on the lines of the Briston School of Building and has obtained a certificate of proficiency from the principal, the period so spent is to count as part of the apprenticeship and the apprentices will start at the third year's rate of wages.

The training is to be of two kinds—in the workshop and on the job. The employer shall undertake that every opportunity shall be given the boy to learn the trade to which he is apprenticed. In the continuation school all apprentices who have not obtained a certificate from a day technical school shall be bound during the first two years of apprenticeship to attend such during the employer's time for one whole day or two half days every week—or a minimum of six school hours—as may be found most convenient to the employer without deduction from wages and shall further be bound to attend evening school for two evenings each week while the schools are open.

All apprentices during the third and fourth year of their apprenticeship shall be bound to attend technical classes for two evenings each week while the schools are open. All apprentices shall be encouraged to qualify for the Institute medals and award.

Cost of Chicago's First High Buildings

While the subject of high cost of building construction is being agitated, it is interesting to note the figures in connection with the cost of some of the first high buildings erected in the city of Chicago. These figures are found in a recent issue of the *Western Architect* and were compiled for the editor of that journal previous to 1904 by William Le Baron Jenney, architect. This memoranda includes the following:

	Cost per Cu. Ft.
Champlain Building, D. H. Burnham & Company, architects	42c.
Phoenix Building, Burnham & Root, architects	55c.
Columbus Building, W. W. Boyington & Company, architects	50c.
Monadnock Building (old), Burnham & Root, architects.	42c.
Rand, McNally Building, Burnham & Root, architects	28c.
Western Bank Note Building, Charles S. Frost, architect.	34c.
Pontiac Building, Holabird & Roche, architects	35c.
Caxton Building (Interior Building), John M. Van Osdel & Son, architects	32c.

FIREPROOF BUILDINGS—IRON AND STEEL CONSTRUCTION

Sibley Warehouse, George H. Edbrooke and Jarvis Hunt, architects	10 7/10c.
Monadnock Building (new), Holabird & Roche, architects.	39c.
Marquette Building, Holabird & Roche, architects	37c.
Woman's Temple, Burnham & Root, architects	37 to 40c.
Athletic Club, Henry Ives Cobb, architect	50 to 55c.
Venetian Building, Pond & Pond, architects	42 to 44c.
Marshall Field Building, D. H. Burnham & Co., architects.	40c.
Old Colony Building, Holabird & Roche, architects	38½c.
Y. M. C. A. Association Building, Jenney & Mundie, architects	39c.
Reliance Building, Burnham & Root, architects	45c.
Rookery Building, Burnham & Root, architects	46c.
Great Northern Hotel, Burnham & Root, architects.	34 to 36c.
Masonic Temple, Burnham & Root, architects	35c.
Title & Trust Building, Henry Ives Cobb, architect	39c.
Teutonic Building, Handy & Cady, architects (cheap finish)	33c.

It is interesting to note that it was in the foundations of the Rookery building that railway rails first superseded dimension stone, this form of pier base construction continuing until the introduction of concrete caissons in later buildings.

Convention of Master House Painters

A Gathering Which Was Notable in the History of the Ohio Association

ONE of the largest conventions ever held by the Master House Painters' and Decorators' Associations of Ohio was the twenty-sixth annual assembly of that organization at Put-in-Bay on July 24 to 27. For a number of years this association has held its summer meetings at Cedar Point, making them largely "outings" for the members and their families. The change in location for the gathering this year served to stimulate the attendance which crowded the capacity of the Crescent Hotel used as headquarters. Sessions were held in the Assembly room of the City Hall.

The Opening Session

On the first morning an address of welcome was given by the Mayor, followed by the annual address of President C. M. Uber of Youngstown, indicating the growing strength of the organization, which has already passed its quarter century mark. A paper by W. A. Alpers of Cleveland on "Business Courtesy" contained some valuable suggestions and received marked attention. This was followed by a Question Box.

The Second Day's Session

The second day of the convention was devoted to the discussion of the workmen's compensation law with special reference to the amendment to the Ohio statutes making owners and general contractors liable for injuries to workmen as well as the sub-contractor directly employing such workmen. An instructive illustrated talk on "Are the High Prices of Painting Materials of To-day Warranted?" was given by J. R. McGregor of the Eagle-Picher Lead Company of Chicago. A paper by George J. Lang of Cleveland, on "Has the Artistic Wood Finishing of To-day Sacrificed Durability?" and a paper by A. H. McGahn of Washington, D. C., on "Over-Head Cost of Conducting the Painting Business of To-day as Compared with Former Years" were listened to with much interest.

Some of the Papers Read

On Thursday papers were read by E. T. Holmes of Cleveland on "The Value of a Credit Rating to the Master Painter and the Means of Establishing Same" and by W. D. O'Connor of Youngstown on "How Can Competitors Co-operate for the Betterment of Trade Conditions?"

The social features of the convention were in charge of a special committee, each afternoon being devoted to recreation according to a well devised program. The annual dinner was held on Wednesday evening when addresses were made by several invited speakers.

It was decided to hold the next convention at the same place, the exact date to be fixed by the executive committee during the coming summer.

The Officers Elected

The old officers were re-elected as follows:
President, C. M. Uber of Youngstown.
Vice-President, L. J. Schultz of Toledo.
Sec'y-Treas., Joel Kennedy of Cincinnati.

Model Homes for Workingmen

A model town for workingmen is about being built at Port Wentworth, near Savannah, Ga., the plans having been prepared by Architect Charles W. Leavitt, who is the same architect that recently completed plans for model cities at Wilmington, Del., St. Helena, Md., near Baltimore, and at other points. The new model city will be erected to provide convenient and comfortable homes at a nominal expense for the workmen at the nearby Port Wentworth Terminal, which is owned by the Savannah & Atlanta Railway.

The plan of the city, which will have its own water supply, sewage system and lighting plant, calls for a white and negro village on opposite sides of the Savannah River, with separate schools, community stores, churches, parks and moving picture theaters. All the cottages will be of frame construction and the white village will be of Colonial style of houses containing three, five, six and eight rooms each. In the colored district there will be 250 bungalows of two rooms each. There will also be two modern hotels for the accommodation of transients. Open air school classes for the children will be provided.

New Style of Fitting Doors

The doors of a certain new house had shrunk horribly, as is the way of the modern door made of unseasoned wood. The builder would not send the joiner to repair them, so the householder tried the ironical method and wrote:

"Dear Sir—The mice can run under most of our doors, but our cat can not follow them. Will you please send a man at once to make room under the doors for the cat, and much obliged?"



A COMBINATION GARAGE AND CHICKEN COOP WITH THE "RUN" SHOWN AT THE RIGHT

Adding Conveniences to the Garage

Some Features Which Add Utility and Beauty with Economy of Space

THE popularity of the automobile is such at the present time as to cause many of the suburban residences now being constructed in various parts of the country to be provided with accommodations for a motor car. Where space is limited it is often desirable to add or combine with the garage some feature which will add to the utility or beauty of the structure.

Especially successful is the combination garage and summer house which is shown in Fig. 1 of the accompanying illustration. The garage itself is composed of large stones, the wall sloping downward as shown. The lower part of the front of tne garage is continued around in a wall which leaves vacant a space sufficiently large to enable the car to be easily turned when desired. This wall is backed by shrubbery which lends a summery and attractive appearance. The summer house on the top of the garage is reached through a rustic entrance which can be seen at the right of the picture. A closer view of this side of the structure is shown in Fig. 2 which clearly indicates the batter of the walls and shows something of the rustic framing of the summer house itself. At the left of the garage, hidden by the growth of shrubbery, is a vegetable garden. The left side of the garage is formed into a hot bed as shown in Fig. 3, thus allowing the owner opportunity to enjoy the



Fig. 1—Showing the Front of the Garage with Summer House on Top



Fig. 2—Showing the Steps Leading to the Summer House



Fig. 3—Hot Bed Built Into the Side of the Garage

pleasure afforded by raising his own vegetables—so popular at the present time.

A combination garage and chicken coop is shown in the panel picture at the top of the page. The architect is August Sundberg, 78 North Avenue, New Rochelle, N. Y. This garage is also intended for one car. The car space is at the left of the garage, and at the right the roof is continued down so as to form a small chicken coop which communicates with the run shown in the picture.

This provides ample opportunity for the amateur poultry fancier to have an attractive structure housing his chickens with but little expense added to the cost of the garage itself, besides an economy of space which is an important feature where land values are high. The walls of this structure are covered by clapboards painted white and the roof shingles of a weathered green.

A Brick Residence for the Suburbs

A Seven-Room House of Compact Arrangement — Various Details of Construction

WE have taken for the subject of our cover design this month a brick residence well adapted for erection in the suburban districts and containing seven rooms and bath. The finished wall surfaces of the house are to be of tapestry brick with wide joints of white cement mortar. The roof is to be of slate with projecting roof beams forming brackets at the cornice line.

Lay-out of the Rooms

The rooms on the first floor are reached through a vestibule which opens into a central hall from which rise the main stairs. Half way up is a landing lighted by an outside window and at this point the stairs turn abruptly about and land in the center of the second floor. The feature of the main floor is the living room, 14 x 22 ft. in area, lighted at front and rear with quadruple windows and with single windows in the right hand outside wall flanking the open fireplace.

At the left of the main hall is the dining room, which communicates with the kitchen through a well equipped pantry, a feature of which is the sink, with double drain board placed directly under an outside window so as to afford ample light. The kitchen is at the rear and is equipped with cupboards and closets, range and boiler. It has an outside entrance directly from the rear porch.

The stairs to the cellar lead directly from the kitchen and for a portion of the distance under the main flight. An outside window affords good light.

The Second Floor

On the second floor are four sleeping rooms, each of which is provided with one or more clothes closets. Each of two of the bed rooms is lighted by a triple window directly underneath which is a convenient seat. The bathroom is in the front of the house directly over the vestibule and is lighted by an outside window. Opening from the hall on this floor is also the linen closet.

According to the specifications of the architect, the excavating is to be carried down to a sufficient depth to allow of a cellar 7 ft. 6 in. in the clear. The foundation walls are to be of brick 18 in. thick properly set on a footing course of concrete 12 in. thick and projecting 6 in. on both sides. All piers are to start on footings 4 ft. below grade.

The Main Walls

The main walls of the first and second stories are to be constructed of brick, faced with tapestry brick, with courses of stretchers as shown. There are also to be designs in ornamental brick, where shown on chimneys and wall faces.

The chimneys are to be constructed of brick, with the exposed surfaces finished in tapestry brick, the same as the other wall surfaces. All flues are to be tile lined.

The Framing Timbers

The first floor beams are to be 2 x 10 in., the second floor beams 2 x 8 in., and the rafters 2 x 8 in., all of yellow pine and placed 16 in. on centers; the studs are to be 2 x 4 in., placed 16 in. on centers and doubled at all openings.

The rafters are to be covered with sheathing boards, over which is to be placed a layer of building paper, and this in turn covered with slate.

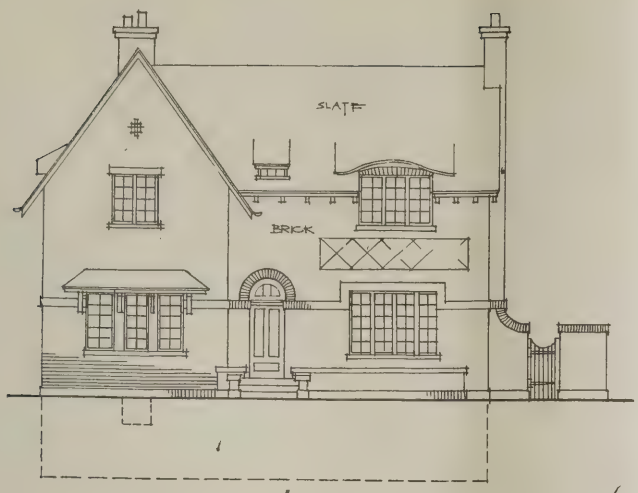
The flooring is to be tongued and grooved maple and the floors are to be double. The trim is to be of a plain, neat pattern with no base block. The kitchen is to be wainscoted with ceiling stuff 5 ft. above the floor.

The Plastering

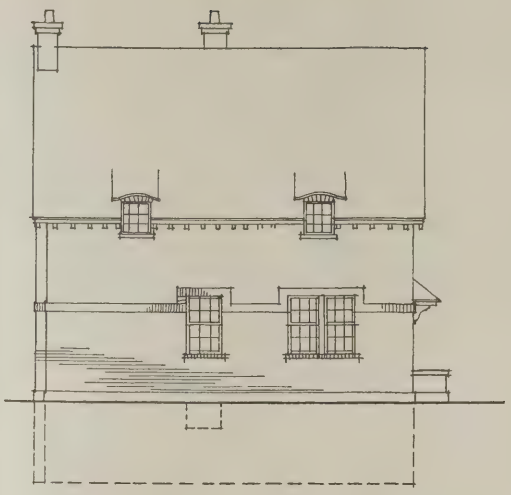
The rooms are to be plastered with three coat work, sand finish, and the closets are to have a hard finish. All exterior walls are to be stripped with furring strips secured to wood grounds in the brick work for applying the lath and plaster.

All necessary structural and ornamental hardware is to be installed in the best workmanlike manner, and all necessary locks, bolts, etc., are to be supplied.

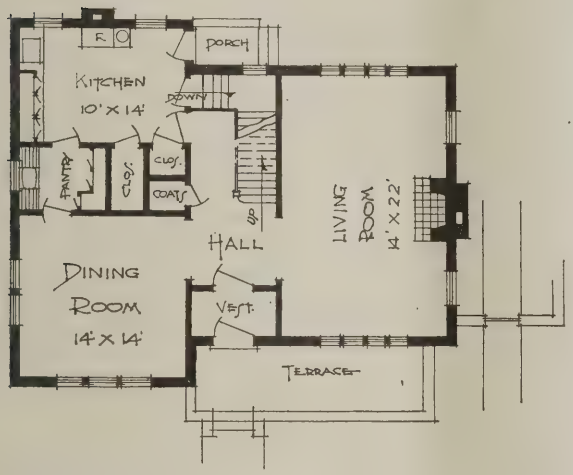
The house is to be heated by hot air and registers are to be placed in the side walls near the floor in all rooms, the capacity to be sufficient to maintain a



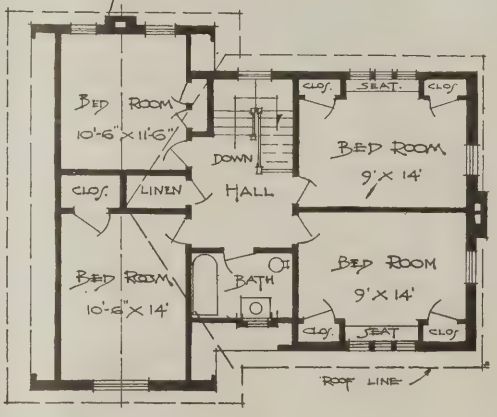
FRONT · ELEVATION



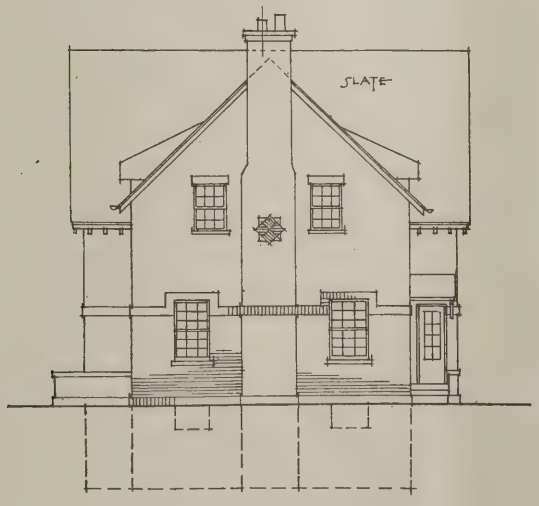
SIDE · ELEVATION



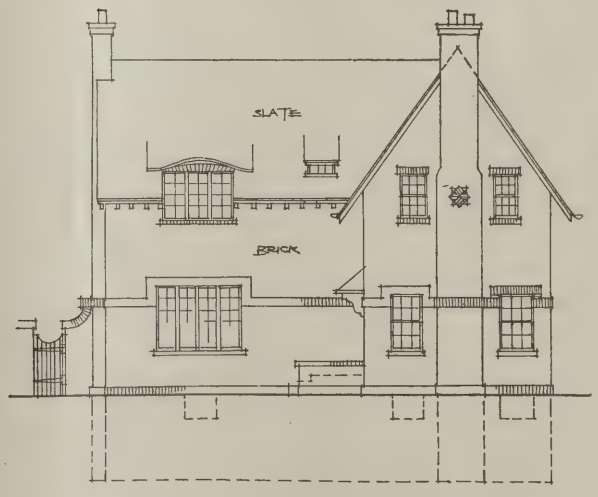
FIRST · FLOOR · PLAN



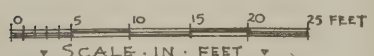
SECOND · FLOOR · PLAN



SIDE · ELEVATION



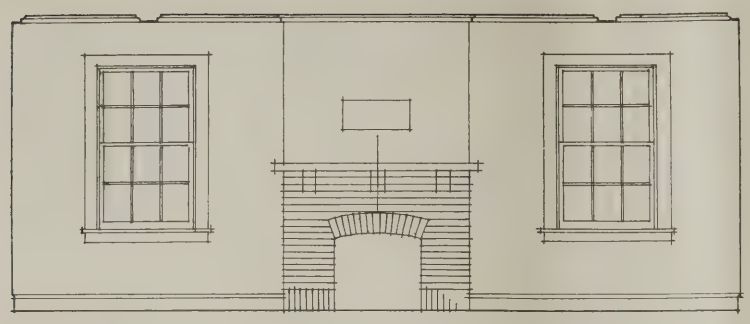
REAR · ELEVATION



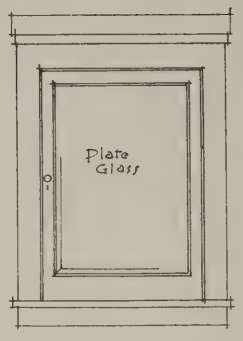
SCALE · IN · FEET

FRANK T. FELLNER
ARCHITECT

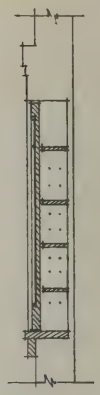
PLANS AND ELEVATIONS OF THE BRICK HOUSE SHOWN ON THE FRONT COVER



ELEVATION OF LIVING ROOM

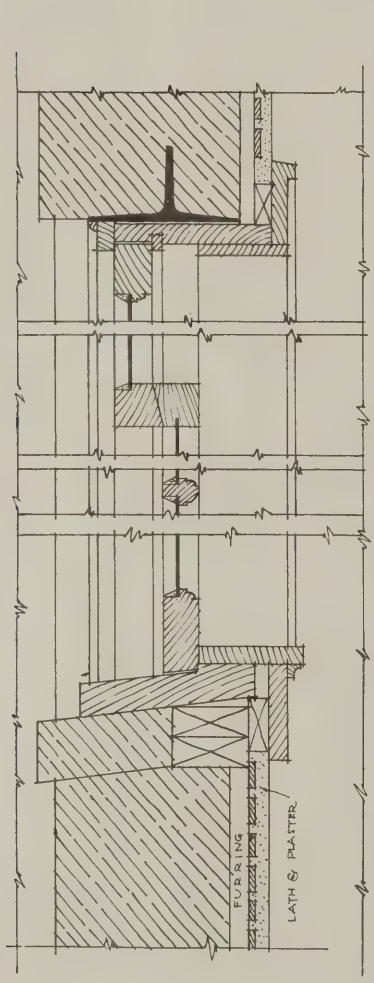


ELEVATION

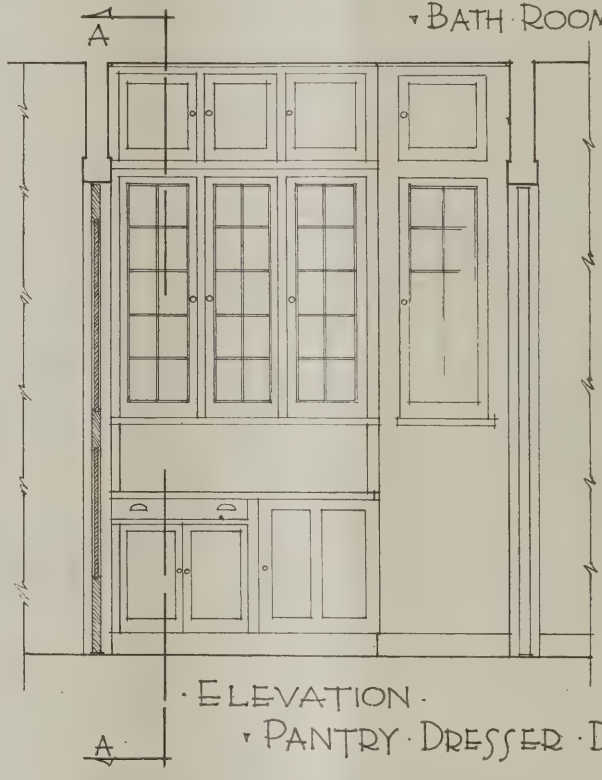


SECTION

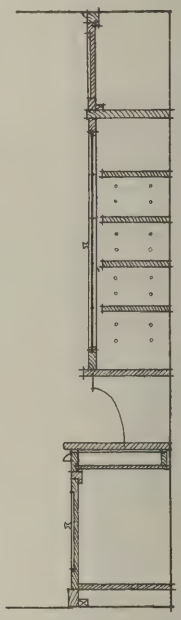
BATH ROOM MEDICINE CLOSET



SECTION SHOWING DOUBLE-HUNG WINDOW



ELEVATION

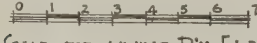


SECTION A-A

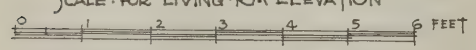
PANTRY DRESSER DETAIL



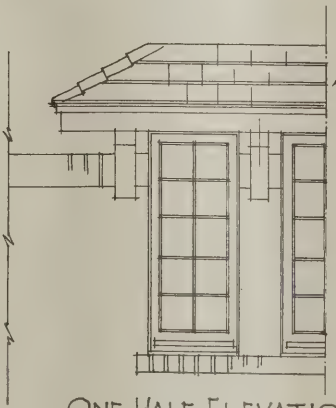
SCALE FOR DETAIL ABOVE



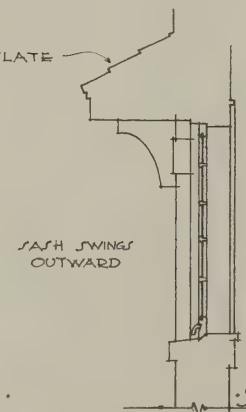
SCALE FOR LIVING R'M ELEVATION



SCALE FOR MEDICINE CLOSET AND PANTRY DRESSER



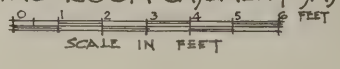
ONE-HALF ELEVATION



SECTION

DETAIL SHOWING DINING ROOM CASEMENT SASH

FRANK T. FELLNER ARCHITECT



SCALE IN FEET

MISCELLANEOUS CONSTRUCTIVE DETAILS OF THE BRICK HOUSE SHOWN ON THE FRONT COVER OF THIS ISSUE OF THE PAPER

comfortable temperature within when the thermometer registers zero weather outside. The pipes and register plates exposed are to be bronzed. The boiler is to be of sufficient capacity to maintain a temperature of 70 deg. in the rooms.

The house is to be piped for a main line for the plumbing fixtures, vents, etc., with 4-in. running trap and fresh inlet at the front of the house, or it may be placed at the side, according to which is most convenient. The main vent lines are to be 3 in. cast iron and the branch vents to be 2 in. cast iron. All fixtures are to be of porcelain enameled iron of the latest design. A small laundry is to be constructed in the cellar and is to be fitted with two soapstone tubs.

The bathroom is to have a floor of tile and a base 8 in. high of the same material.

Piping is to be installed for gas and the house wired for electric fixtures throughout. The fixtures are to be of the combination pattern of plain design and finish. There are to be wall outlets for the bedrooms and ceiling drops for the living room, the dining room and the hall, with an outside lamp in front of the entrance door.

All exterior trim and woodwork is to receive three coats of dark brown paint and the doors are to be varnished. All inside trim is to be filled and varnished and the floors are to be varnished. The leaders and the gutters are to be painted a dark brown. All ridges, valleys, hips, etc., are to be flashed with tin, painted both sides before laying. The gutters and leaders are to be of galvanized iron and the gutters are to be hung with adjustable hangers graded to the 3-in. leaders which are to empty outward from the ground.

According to the estimate of the architect, the cubical content of the house is placed at 28,196 cu. ft., on which a unit price of 25 cents has been placed, and he states the approximate estimate is based upon average figures per cubic foot which would prevail in moderate sized towns and suburban developments throughout the country. He also states that these figures do not include the contractor's customary profit. Some of the more important items are excavating, $175; grading, $110; masonry, $2,679; plastering, $370; tile work, $140; carpentry and mill work, $1,550; heating, $460; plumbing, $470; gas and electric works, $490; painting, $200; hardware, $110; metal work, $175.

The house shown on the cover of this issue and illustrated and described herewith was designed by Frank T. Fellner, architect, of 413 Caton Avenue, Brooklyn, N. Y., or care of the BUILDING AGE, 243 West Thirty-ninth Street, New York City.

Better Business Methods in the Building Industry

What a Member* of a Prominent Eastern Contracting Company Has to Say on the Subject

"WHEN we come to the question of buying, we find a similar unsystematic and unbusinesslike way of going at the problem. In a manufacturer's office, his purchasing is handled by a special department in charge of a purchasing agent, whose sole business is to do the buying. He reads his trade papers, watches the trend of the market, knows when it is a favorable time to buy things. Before making any purchases, he knows what he wants to buy, what it is worth, and when he wants it.

Difficulties of the Contractor in Making Purchases of Materials

"The contractor, however, when he sets out to purchase material for a new building, generally has no man delegated for the purpose, and attempts to do it himself. Not having sufficiently studied the matter in advance, he does not know the best parties to buy from, and under the pressure of his immediate need makes a hurried general canvass of the market. When he comes to such items as doors, windows, plumbing, plastering, etc., he treats the dealer, or subcontractor, the same way that the architect or owner has treated him—shows him the plans and specifications, and says in effect: 'I want some doors, windows, or what not; I don't know how many, or what they are like; find out for yourself what I want, and give me a bid on it.'

"The subcontractor meekly does this because he has to, and after having studied the plan for a very short time under difficult conditions, and made as good a schedule as he can, and possibly pricing it with a liberal allowance for safety to cover errors and omissions, puts in a bid against other bids made in about the same way. Figures put in on this basis are always higher than those put in on a definite schedule.

The Buying Should Be in Competent Hands

"The experience of those who have tried it proves that it pays to put the buying in the hands of some one who will give intelligence to it, and

*Leslie H. Allen of Aberthaw Construction Co.
Concluded from page 421 of August issue.

as far as possible make an accurate dimensioned schedule for all the articles required, and get bids upon this basis. The saving more than offsets any extra expense which so often crops up on account of mistakes under the 'happy-go-lucky' plan.

"Another important point in buying is buying from the right party. Many are content to deal for all quantities, large or small, at one place without ever canvassing the very considerably larger market that is always available.

Importance of Cash Discounts

"In purchasing, also, the importance of cash discounts is often overlooked. One thousand dollars borrowed at five per cent for the purpose of taking cash discounts, and turned over ten times in a year, will show a clear profit from $75 to $150 per year, besides which the contractor's credit rating will be improved, resulting in lower quotation from dealers and manufacturers.

"Another point in buying is watching the markets—buying at the right time, in anticipation of the rise or fall in price of material. Those who are doing a large business very frequently make a contract in advance for standard articles. This is rarely thought of by the average contractor.

An Adequate Staff Essential

"We now come to the third main division of the business of manufacturing buildings. Contractors, as a rule, do not employ as large a force of responsible directors of the work as is advisable in reasonably large undertakings. In a contractor's organization he often has no more assistance than a general superintendent, a timekeeper, and a material clerk; and these men are expected to control expenditure of a payroll of $1,000 a week or more, the receipt of $2,000 worth of materials per week or more, and supervision of all the subcontractors' work. When considering the matter carefully, it does not seem that one superintendent, with two clerks, can possibly take control of all this expenditure, as well as the responsibility of giving accurate lines and grades, arranging for the proper supply of labor and the co-ordination of work, tracing shipments of material and following them up, so that there shall be no delay, and attending to other details inevitably connected with work of any considerable size. This is one of the reasons why jobs often take much longer to erect than has been contemplated, and also run into so much more money than has been estimated.

Staff Necessary to Do Good Work

"For a $150,000 job, an organization consisting of a superintendent, a material clerk, a chief clerk, a timekeeper, a cost man, an engineer for lines and levels, a concrete foreman, a carpenter foreman, and a labor foreman will generally, if properly co-ordinated, make the work go with such snap that the actual overhead expense of these heads is more than saved in the shorter time and lower cost of the work done. Contractors are beginning to see that in an organization of this type is to be found the solution of many of the troubles incident to building work.

Keeping Track of Labor Costs

"To aid the contractor in the supervision of the work, he also needs a proper system of keeping track of labor costs, following somewhat the plans adopted in many manufacturing establishments. If this careful following up of labor costs is necessary in factories where the same thing is being done day after day, week after week, it is certainly much more essential in building operations where different things are being done under differing conditions day after day, week after week. With a proper system of cost-accounting, a contractor may know if brick work on one job is costing five dolars more a thousand than on another job, and he can at once look into the matter, and remedy the faults if any are to be found. At the time of a contractor's visits to his own work it is noticeable that everything is usually going at its best, partly because his presence on the job acts as a stimulus; but 'cost accounts' are working for him when he is not there, and are keeping a watch that is better than his own observations as to how the work is going. Those contractors who spend most on cost-accounting systems will tell you that they will be the last to give them up, because of their great value, and this value is primarily in the supervision of current operations; the use of figures for information for future jobs is secondary to their value in superintending current work.

Improvements in Methods Essential to Success

"I wish to say that in drawing these parallels between the industrial manufacturer and the building contractor I have outlined several improvements in business methods which may seem new and startling to some of my hearers. I want to point out, however, that I have outlined nothing that has not been done by successful contractors, and, as far as my information goes, the contractors who have adopted the business-like methods that I have outlined are those who are making a name and success for themselves in the business field.

Several weeks ago orders were issued from the office of the president of the Borough of Manhattan to widen the sidewalks and streets by cutting off all projections beyond the legal building line in Forty-third, Forty-fourth, Forty-fifth and Forty-sixth Streets between Madison Avenue and Broadway, New York City. Two feet will be clipped from the sidewalk on each side, giving 4 ft. additional for vehicles, while the removal of the projections will leave practically as much sidewalk space as at present. The cost of the changes on these streets is estimated to be approximately $1,000,000.

Sewage Disposal for Isolated Houses*

The Septic Tank—Cost Data Covering Labor, Materials and Time Consumed in Building

By Harry Gwinner

THE septic tank, which receives the sewage, is made of a mixture of one part of cement, two parts of sand and four parts of gravel. The top, sides and ends and bottom were reinforced with steel rods. Upon consulting Figs. 4 and 5 it will be noticed that the tank has two compartments or chambers, one of which is the settling chamber and the other the discharge chamber. The sewage is discharged into, settled and partially purified in the settling chamber. It slowly seeps under the baffle boards; then over the concrete partition wall into the discharge chamber and when sufficient has collected in this chamber, it is intermittingly discharged from this chamber by the automatic siphon into the tile leading to the point of disposal.

This septic tank has a capacity to take care of the flushings of 50 gallons per person and to discharge at intervals between twelve and twenty-four hours. There is no advantage in having a tank larger than necessary to properly perform the work, for then the liquid sewage remains too long and putrefaction is likely to occur. If the siphon fails to discharge during the proper working periods owing to not having received sufficient sewage, flush sufficient water through the toilet to make it do so.

After digging the pit to the dimensions for the septic tank, it was found that the earth was so firm that no outside forming below the ground was necessary. The concrete was mixed to such a consistency that when rammed with a moderate pressure water came to the surface and a spade was used edgewise to work well against the sides and very close attention was paid to this point, as the object was to waterproof without using a compound.

Concreting was begun on the settling chamber

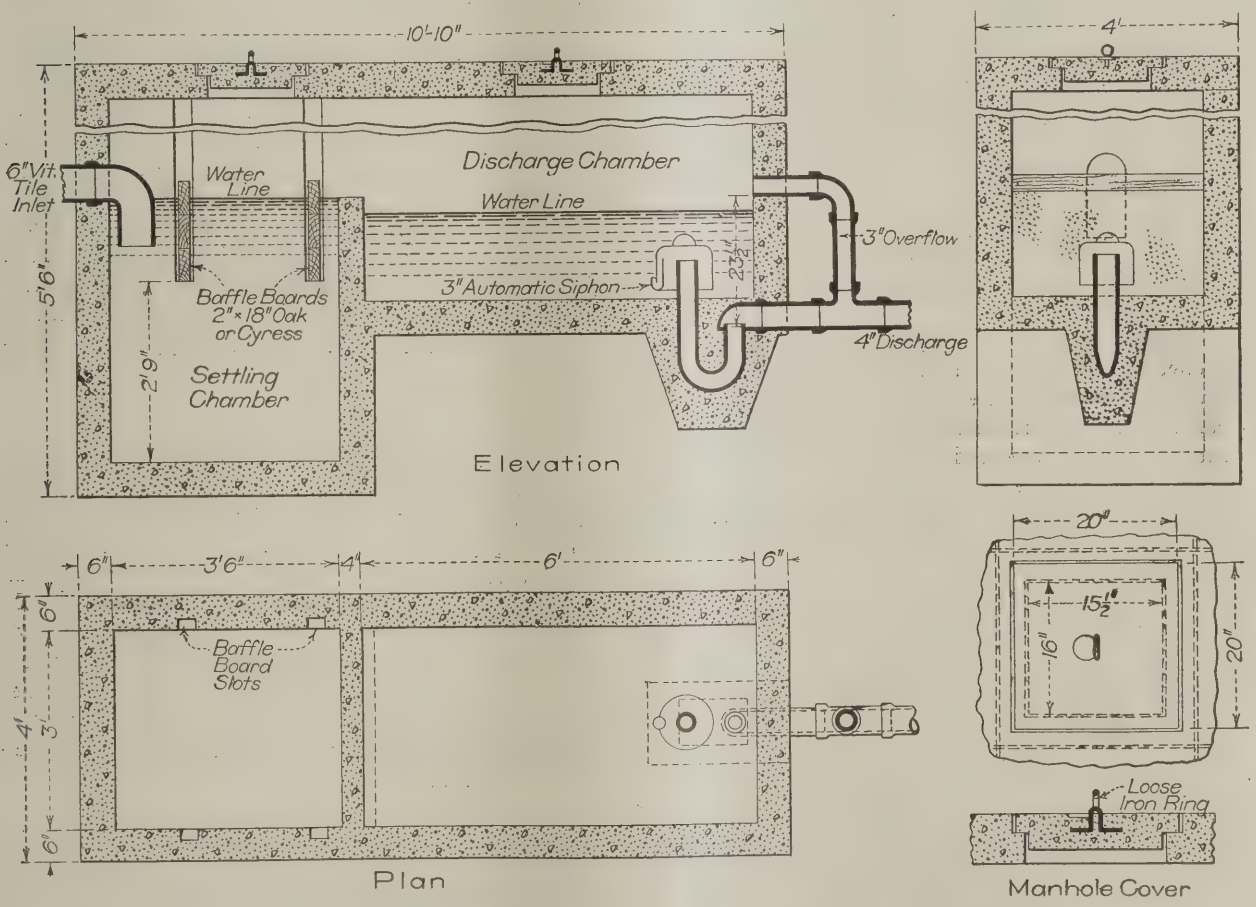


Fig. 4—Elevation With Vertical and Horizontal Sections of Septic Tank

*Concluded from page 432 of the August issue.

first and sufficient concrete was put on the floor to bring it up to the first line of metal reinforcement. Then the reinforcing rods were placed lengthwise and crosswise as shown in the reinforcing diagram, Fig. 5, and to prevent them being displaced they were tied with stovepipe wire where they crossed each other. Concrete was then added and tamped to within the finishing line of the floor. Sufficient planking was then placed upon the floor for the workman to stand on.

List of Reinforcement

¼-in. Round Reinforcing Rods.

BOTTOM

No.	Description	
9	3 ft. 8 in.	Crosswise.
4	4 ft. 2 in.	Lengthwise retention chamber.
4	6 ft. 8 in.	Lengthwise discharge chamber.

END WALLS

10	3 ft. 8 in.	Horizontal.
4	4 ft. 2 in.	Vertical—middle wall.
4	.....	Vertical—4 in. less than outside depth retention end.
4	.....	Vertical—4 in. less than outside depth discharge end.

SIDE WALLS

4	4 ft. 2 in.	Horizontal retention chamber.
4	10 ft. 6 in.	Horizontal.
8	.....	4 in. less than outside depth retention end.
12	.....	4 in. less than outside depth discharge end.

TOP

12	3 ft. 8 in.	Crosswise.
2	10 ft. 6 in.	Lengthwise.
1	3 ft.	On between manholes.

The Inside "Forms"

For the inside forming 1 x 6-in. tongue and grooved stuff was used, dressed both sides. The forming was made one board high all around. The boards for the side walls were placed first and then the boards for the end walls, these latter boards going between the sidewall boards and being prevented from being forced in by having cleats nailed upon the side boards. These cleats ran to the top of the tank.

It is well to note here that none of the nails used on this work was driven home, but protruded sufficiently to be caught by a claw hammer.

Then the vertical reinforcement was placed all around, being pushed through the concrete floor and then the first horizontal row of wall reinforcement was placed and tied with wire to the vertical rods at a distance of 10 in. from the floor. To hold the ends of the vertical rods firm, a horizontal row of rods was tied near the top all around. Concrete was then added and tamped home until the edge of the forming was reached. Then another row of 6-in. boards was added and the process continued until the earth line of the floor of the disposal chamber was reached.

Placing the Siphon

Be sure to have the siphon properly placed and held by cementing the trap or "U" shaped portion before work is begun on the disposal chamber floor. Be particular in locating the siphon as to its height, as very little variation will prevent it working.

Proceed relative to the floor of the discharge chamber as in the case of the settling chamber, and then carry all walls up together.

When the location for the baffle boards was reached, lugs 2 x 3 in. were tacked to the inside of the forming to serve as pockets in the walls for these boards.

The top is a portion of the sides and ends, being cast with them, and while the drawing shows the top to be flat, it was rounded in direction of its width so as to readily shed the rain.

This tank is in a field which is cultivated and was made to project 6 in. above the ground level so that the plowman would not strike it.

To prevent the forming bulging at the center due to the pressure of the concrete, 2 x 4-in. stuff was tacked against it vertically—sides and ends—and 1-in. stuff was sprung horizontally between them to keep them apart.

Not Necessary to Waterproof the Tank

As the concrete work was very carefully done it was not deemed necessary to waterproof the tank. Should the reader desire to make a damp-proof and fairly watertight tank, he will find much information on this subject in Bulletin No. 230, issued by the Office of Public Roads, U. S. Department of Agriculture, Washington, D. C., and in an article on "Oil-mixing Concrete" in the BUILDING AGE, page 54, December, 1916.

The discharge chamber is fitted with an additional outlet which is placed above the siphon outlet and at a distance not less than shown on the sketch. The object of this outlet is to permit the sewage to escape in case the siphon becomes clogged or refuses to work.

Entrance for the Sewage

One of the fundamental ideas in connection with the successful working of the system is that the bacteria in the tank shall not be disturbed any more than is absolutely necessary. For this reason the sewage from the supply side should enter the tank through a circular elbow pointing downward, so that the discharge will not be less than 9 in. below the surface of the sewage in the tank. The writer believes that 12 in. would be better. The reader will note that the discharge end of the siphon also has a circular elbow on the discharge end to facilitate the operation.

The Baffle Boards

The baffle boards shown in Fig. 4 are for the purpose of assisting in preventing a rapid flow toward the discharge chamber. These baffle boards were made in sections 6 in. wide, so as to facilitate placing them in position. They were placed in position after the tank was completed. They were made 3 in. longer than the width of the tank and, by inching them, fitted the slats very nicely. It is well to note this with reference to the width of the boards, as they will have to be replaced in time, and difficulty will be experienced in placing them if much wider boards are used.

Fig. 6 gives the details of the fittings from the

hopper to the septic tank line and is added, as such are often desirable to know.

The time consumed by three laborers in completing the tank, together with a carpenter and his helper, was four and one-half days. This included the excavation and trimming. The pay of the laborers was 15 cents per hour, the carpenter 27 cents and the helper 24 cents. The laborers were employed four and one-half days of ten hours each on the job, the carpenter thirty-three hours and the helper twenty-seven hours.

The total cost of the tank was $82.60. The cost of the various items is shown in the summary.

It is necessary that the discharge from the tank be intermittent, for if the sewage is allowed to pass reaching the high water line (H. W. L.) the column of sewage in the long leg has been forced down sufficiently to pass below the bend at *F* and the pressure of the confined air is sufficient to force out all of the sewage in the short leg *C*. This relief permits the escape of the air from the bell *D* and the long leg, and the sewage rushes from the tank to the siphon to take the place of the escaping air, and the sewage continues to flow until the level in the discharge chamber reaches the lower edge of the bell, which completes the cycle of operations.

The width of the ditch in which the tile was laid was just enough to permit stooping 24 in., and the distance from the surface to the center of the tile was about 30 in. below the surface of the ground.

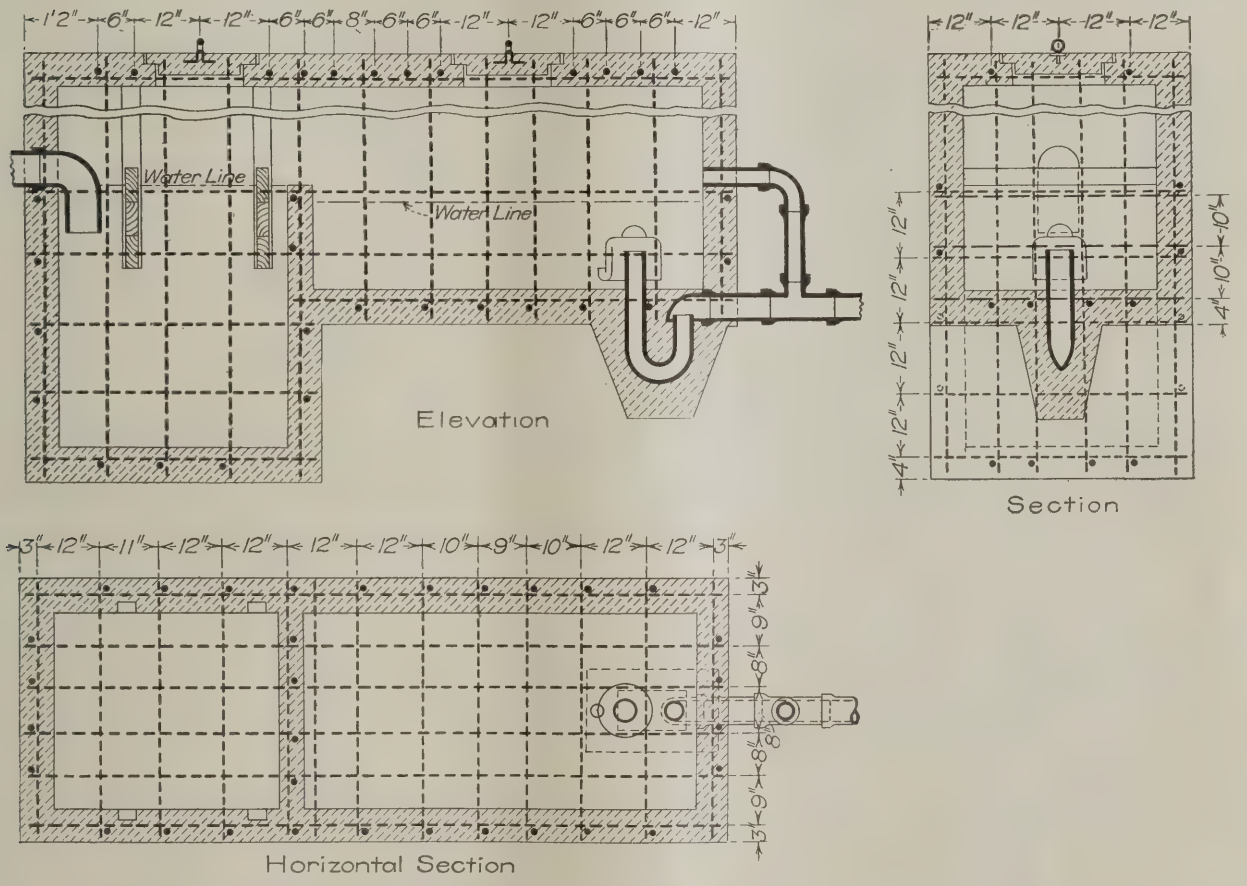


Fig. 5—Elevation and Sections Showing Reinforcement of the Septic Tank

into the disposal field in the irregular way in which it leaves the toilets, the disposal bed will become clogged, due to saturation in spots. For this reason the siphon and the spreading troughs are used.

Fig. 7 illustrates the automatic siphon of the "Miller" type which is used in this tank. Normally the U-shaped pipe or siphon trap *A* stands filled with sewage some little distance below the top *B* of the short leg *C*. As the liquid enters the discharge chamber it increases the amount of sewage above the low water line (marked L. W. L.), its weight compresses the air in the bell *D* and the long leg *E* of the siphon. When the compression becomes sufficient, the sewage in the trap rises in the leg *C* and trickles out through the discharge pipe *P*. Upon

This distance of 30 in. placed the tile below the frost line in the section of the country where the tank was located.

In order to have a uniform grade with the proper slope a guide line as shown in Fig. 8 was used. The support frames were placed 20 ft. apart and tacked to top of slope stakes, and the guide line was stretched over these and the ends made fast as shown. It was placed high enough above the ground so as not to interfere with the trenching and the laborers could at all times test for the depth. When nearly down to the proper depth the bottom was skinned and tested with a straight edge. This method, while despised by some, was found to give excellent results and the writer considers it superior

for shallow trenching to the stake method by using boards just above the ground, and where more than one laborer is employed. Fig. 9 shows the guide line support.

Relative to the grade to lay tile for such work as this, it is advisable for it to be not less than 9 in. per 100 ft.

For the dimensions of septic tanks of large capacity and the various dimensions for 3, 4 and 5-in.

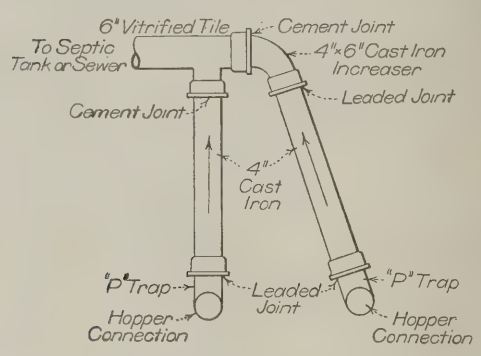


Fig. 6—Details of Fittings from Hopper to the Septic Tank Line

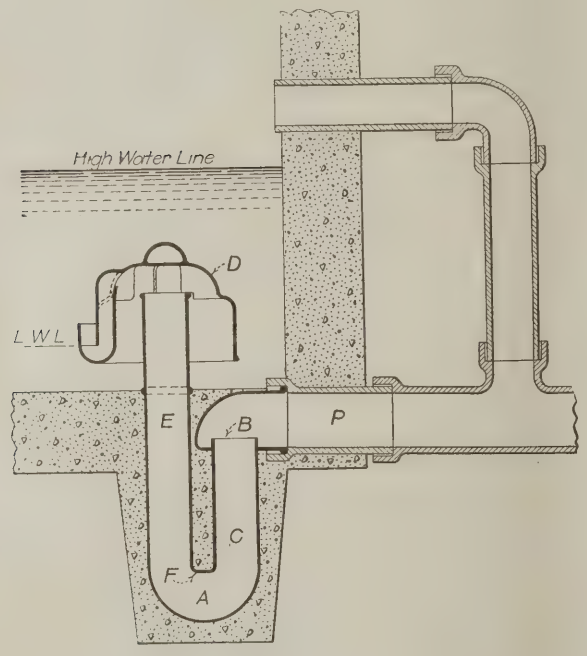


Fig. 7—The Automatic Siphon of What Is Known as the "Miller" Type

Itemized Cost of Preliminary Portion of Sewage Disposal System

The itemized cost of the system follows:

Toilet

Two anti-freezing hoppers	$25.00	
Cast iron soil pipe and fittings connecting to disposal line	9.50	
Galvanized water pipe and fittings	3.60	
28 lin. ft. of ditching of water line to toilet	1.20	
Mechanic's time connecting	9.35	
Total	$48.65	$48.65

Sewer Tile Line from Toilets to Disposal Point

53 cu. yd. of excavation (width 2 ft., average depth 33 in.)	$21.75	
260 ft. of 6-in. sewer tile	22.00	
Laying tile	1.20	
Back filling and tamping	6.45	
Total	$51.40	51.40

Septic Tank

11 cu. yd. excavation and trimming	$8.70	
100 lb. of reinforcing metal	3.50	
22 bags cement	9.90	
1¾ yd. sand and 4 yd. gravel	8.70	
One 3-in. siphon	13.25	
Lumber for forms	9.00	
Carpenter and helper making forms	15.40	
Nails—5 lb. 6d., 8d. and 10d. mixed	.25	
Mixing and laying concrete	9.60	
Six tile fittings	1.60	
Baffle boards	1.20	
Tearing out forming	1.50	
Total	$82.60	82.60
Mechanic's overseeing time		36.00
Total cost of system		$218.65

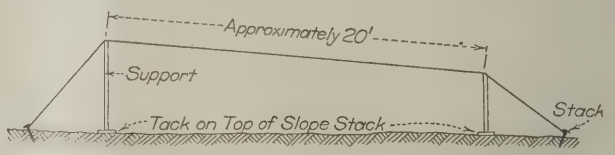


Fig. 8—Showing Arrangement of the Guide Line

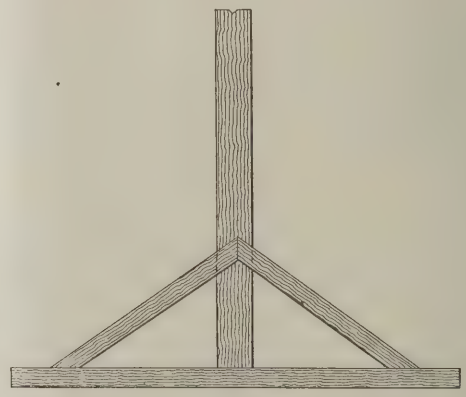


Fig. 9—One of the Guide Line Supports

SEWAGE DISPOSAL FOR ISOLATED HOUSES—VARIOUS IMPORTANT DETAILS

siphons the reader is referred to Bulletin No. 57, U. S. Department of Agriculture, Washington, D. C.

Synopsis of Cost of System

Plumbing, including two anti-freezing Kemp toilets	$48.65
260 ft. of 6-in. sewer tile in place	51.40
Septic tank complete	82.60
Mechanics, overseeing time	36.00
Total	$218.65

To this should be added the amount which would have to be paid a surveyor and assistant. It requires two hours to run the proper lines by these two men.

For house building in Russia all sorts of materials are used, beginning with the peasant's hut made of logs, chinked with earth and sometimes plastered with mud on the inside, to the great palaces of beautifully chiseled stone. The middle classes live in houses built of wood, much as the same classes do in the United States. The wealthy have their magnificent mansions of brick and terra-cotta, or stone, many of them highly ornamental, as befits the Oriental tendency which is a characteristic of Russian life.

CORRESPONDENCE

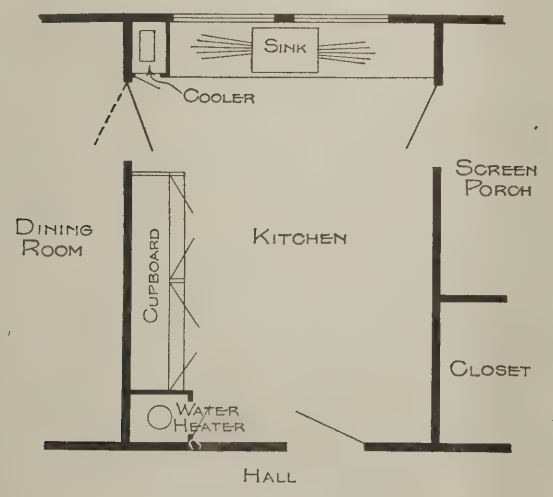
A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

A Kitchen of Built-In Conveniences

From Charles Alma Byers, Los Angeles, Cal.—Some of the readers may be interested in a well-planned kitchen for a small, inexpensive home and I am therefore sending a plan and an interior view. The room is 9 ft. by 12 ft. 6 in. in floor dimensions. It has one outside wall, in which are two broad windows, and in each of the three remaining walls is a doorway—one each leading to the dining room, the rear-entrance porch and a short hall.

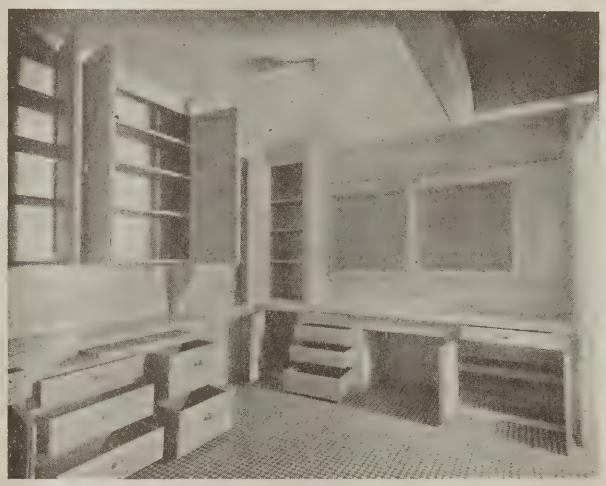
Its large assortment of excellent built-in conveniences makes the room particularly desirable, to the housewife who wants "a place for everything and everything in its place." As will be observed by referring to the picture, the sink and drainboards are located beneath the pair of windows, which occupy one of the 9-ft. walls, and hence receive in the daytime a flood of natural light, while an electric-lighting fixture is conveniently placed between the windows above for use at night. The room is also equipped with the usual ceiling lighting fixture.

The drainboards are elevated 33 in. from the floor, and extend 22 in. from the wall. They, as well as the sink, are of composition, and hence



Floor Plan of Kitchen Showing Position of Fixtures

both sanitary and easily kept clean. Underneath the drainboard at one end is a single drawer, besides a roomy shelf-cabinet, and underneath the section at the other side of the sink, which is shorter, because of the draught cooler, are four drawers. The draught cooler, or "cooler closet," is divided into two compartments, and, with all shelves provided with wire-screen centers, is open all the way through from the basement to the roof, permitting a free circulation of cool air.



An Interior View of the itchen

On one of the side walls, as will be observed, is a double cupboard, each section of which contains four 11-in. shelves, and directly beneath this cupboard, with a space of several inches intervening, is a long countershelf, comprised by the top of a cabinet of drawers, of different sizes. A disappearing, or sliding, bread-board is also a feature of this cabinet arrangement, and at the foreground end of the cupboard and drawers is the cabinet-concealed water heater. In addition to the features shown and already mentioned, a hooded smoke vent is provided for the range.

All woodwork in the room is finished in white enamel, and the hard-finished plaster walls, to the height of the top of the windows and doors, are also enameled. The material used for the built-in features, as well as all other woodwork, consists of clear white pine. The doors of the several cabinets are neatly and plainly paneled, and the general simplicity of the designing gives the room a clean, bright and pleasing appearance.

Mistakes of a Builder

From "Interested," Chicago, Ill.—I recently noticed in an apartment building in the city some mistakes that I believe the ordinary builder and architect should seak to avoid. Room was provided

in the pantry for an "outside icing" refrigerator, the refrigerator having an ice chamber in the top as is quite usually the case. The outer door, however, was made the full length of the refrigerator instead of being just the size or a trifle larger than the opening to the ice chamber. The result is that in the winter a cold blast pours through the outer door and around the refrigerator. Water in the trap freezes and it is unsafe to keep vegetables in the pantry. If the full-length door is necessary in order to accommodate any design of refrigerator then the door should fit snugly or be fitted with weatherstrips. My idea, however, is that the full length door is a grave mistake and a piece of false economy in refrigerator construction.

Question in Floor Construction

From John Upton, La Fargeville, N. Y.—In reply to "R. W. B. Graham," Cobalt, Can., whose letter appeared in the July issue, I think the most economical way to support a large floor 30 ft. wide is to place beams across the 30-ft. way and support them by means of rods and stirrups. These beams could be placed as close as needed, say from 10 ft., or even closer, to 14 ft. or 16 ft. apart and could be as heavy as required. They could be either solid or built up of 2 in. planks. A good way would be to use a square stick and spike and bolt selected planks on each side.

The rods should be fastened at the ends through 6 in. timbers or planks running several feet above and below the floor and secured to the 2 x 6 in. studs. It would be well to have a 6 x 8 in. post from sill to plate at each end of the beam. These posts could be built up of 2 x 6's if necessary. Beams are to be mortised into the posts and rods put through the posts. The rods can be ¾ in., 1 in. or even larger. One or two should be placed under each beam and stirrups several feet from each end. These should be on the rods.

One cannot give definite information without knowing more about the number of beams to be used, size of timber allowable, and lengh of stirrups to be used. The load on each beam depends on their number and determines their proper construction.

Difficulty of Architectural Students in Obtaining Positions

From H. D. J., New York City.—Will some practical man answer the question which I have explained below? I have spoken with several architectural students and they have all told me the same story. They have taken a complete architectural course in a certain school in New York City where they had experience in the following subjects:

Millwork, plumbing, estimating, designing, clay modeling, electricity, and those which relate to the architectural part of the line.

It will be noticed that these subjects are taken up from the beginning of the study of architectural drawing.

Geometrical Problems.

Working Drawings (of chairs, tables, stools, etc.).

Representations (of different parts of the house).

Brickwork (bonds, arches, footings, etc.).

Complete set of drawings and tracings of a frame house.

Details of pantries, stairs, cornices, doors, windows, etc.

Orders, Roman, pediments, pilasters, etc.

Orthographic Projections.

Steel Construction.

Perspective Drawing.

Shades and Shadows.

and a good many others. I have also attended the best evening art school in New York City.

Now, with all this experience, why won't an architect give one a job? Because he has no reference? There are students who know and can do better work than a good many experienced draftsmen. Why can't they get a job?

Will some reader also tell me how a beginner can make a few cents in his line while studying, also what he thinks are the best architectural schools in New York City?

Note.—It is a fact generally recognized in the profession that the supply of competent architectural men in New York City is largely in excess of the demand for their services and if a young man has ability in this line he will find in the smaller communities a much better opportunity than in the larger cities where the architects as a general rule draw their draftsmen and office assistants almost directly from the graduating classes of the leading architectural colleges.

What a Veteran Reader Thinks of "The Building Age"

From D. P. Barry, Redford, N. Y.—I have been engaged in the building business for a period of about 33 years and for more than 20 years I have also been teaching. I look on THE BUILDING AGE as an educational journal. On the first day of school we fill out a blank. One of the questions is: "Do you take an educational paper?" For years I have filled in the blank with the *Popular Science Monthly* and THE BUILDING AGE. The latter is a better pedagogical journal than any known to me. The contributors and correspondents use better language and express themselves clearer and more lucid. Some of them would easily make grand teachers, but it's lucky for them they are not. The drawings and illustrations aid the intellect in a natural way. It is doing a great work for the young builders of the country.

Among the principals, chancellors, presidents, teachers and professors with whom I have associated none holds a warmer place with me than the editor. He has a marvelous patience and a

sweetness of temper that is infinite. Like myself, fate has not done just right by him. He ought to be at the head of one of our great universities; the faculty and students would adore him. As to myself, I am not writing for the fun of it, for it is hard work for me. I am trying to set free some of the acquisitions of years that can find expression no other way. The ambitions of early years are all laid away and I feel like Lincoln in his first inaugural address.

It makes no difference to me what the world does. Life is one darn job after another, and this little poem expresses my feelings:

How much would I care for it could I know
That when I am under the grass or snow
The raveled garments of life's brief day
Folded and carefully laid away;
The spirit let loose from mortal bars
And somewhere away among the stars.
How much do you think it would matter then
What praise was lavished upon me, when—
Whatever might be its stint or store—
It never could help or harm me more.

If while I was toiling they had but thought
To stretch a finger, I might have caught
Gladly such aid to buoy me thru
Some bitter duty I had to do
Tho when it was done they said may be
To others—they never vouchsafed to me—
The word of applause so craved—whose worth
Had been the supremest boon on earth,
If granted me then, "We are proud to know
One of ourselves has triumphed so."

What use for the rope if it be not flung
Till the swimmer's grasp to the rock has clung
What help is a comrade's bugle blast
When the peril of Alpine heights be past?
What need that the spurring paean roll
When the runner is safe beyond the goal?
What worth in eulogy's blandest breath
When whispered in ears that are hushed in death?
No. No! If you have but a word of cheer
Speak it while I am alive to hear.

A Six-Sided Cupola on a Twelve-Hip Roof

From W. P., Minier, Ill.—I come to the correspondence department of the paper for a little information concerning a circular corn crib. The crib is 30 ft. wide and laid up with tile. I want to have the roof framed with twelve hips and desire the cupola in the center to be six-sided. I hardly see how every other rafter will form a perfect hip if it has twelve hip rafters and a six-sided deck. The deck is to be 6 ft. in diameter. If any of the readers can help me in the solution of this problem I shall greatly appreciate it.

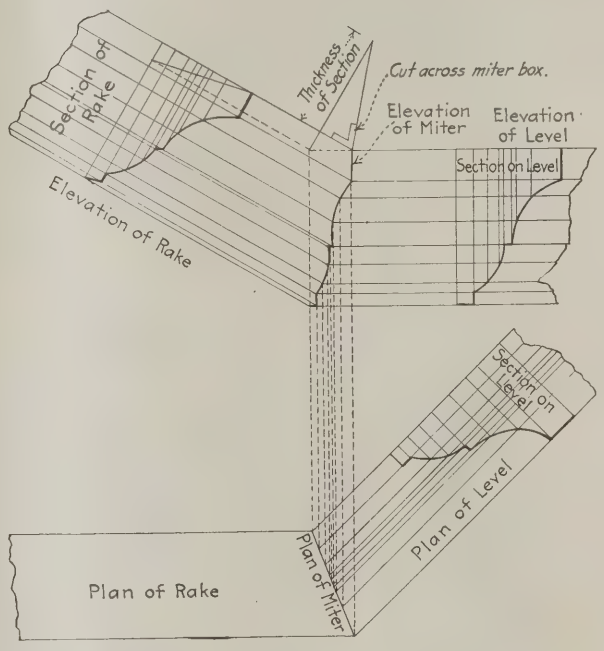
Mitering Rake and Level Moldings

From James Bruce, Wanganui, New Zealand.—In the March issue of the paper W. S. Wilkin shows how to find the section for making molds by the plan of the mold being indicated at right angle. I take the liberty of supplementing this by showing how to find the section when the plan is other than a right angle. It is exactly the same system in both cases, but when the plan is a right angle, the plan need not be drawn as the level section is the required elevation, and may be used as shown by Mr. Wilkin; but when the angle is other than a right angle, the plan and elevation required to be drawn, and any one who can follow Mr. Wilkin's work will easily follow the one for an oblique plan.

I have shown the cut for miter across the box; the side cut will be to the pitch required.

As there are seldom many miters of this kind to cut, a box is hardly ever used, the cut being worked or being marked directly on the mold. In that case the length of the continued line—the top of raking section—will be used square from the pitch instead of the thickness of the section as shown.

There are other ways of finding these raking



Mitering Rake and Level Moldings

mold sections, but this I consider is the simplest, although the others are very interesting problems in descriptive geometry.

Remedying Squeaky Floors

From John Upton, La Fargeville, N. Y.—In reply to "W. J. M," of Lakewood, Ohio, regarding squeaky floors, I would say that his trouble is likely caused by lack of nails. I would suggest that he try using nails or brads. The floors, of course, cannot be blind nailed now. Use small nails and put them down well below the surface. If the holes show, then use putty. Painting over will cover the putty so that the floor will not look bad.

Brick Fireplace Construction

From H. J. Aurlie, Spring Valley, Minn.—I am sending blue print of fireplace which may be of some interest and value to the younger men in the building business. Fig. 1 represents a plan in the basement, Fig. 2 is a plan of the fireplace itself, Fig. 3 is a front elevation, Fig. 4 is a side or end

view, while Fig. 5 is a vertical cross section showing dimensions of flue and thickness of walls.

In a general way it may be stated that ordinary fireplaces should be governed by the following regulations. The height of the fireplace should never exceed the width. The depth "C" in Fig. 5 should be about one-half of the width "D" in Fig. 3. The size of the smoke flue should be about one-tenth the size of the fireplace and extend 2 or 3 ft. above the highest point of the roof if possible.

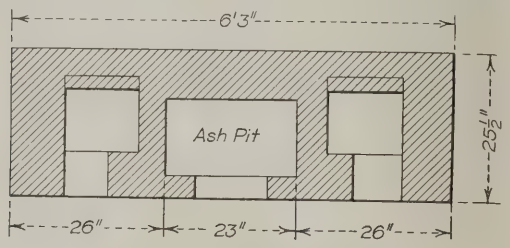


Fig. 1—Plan in Basement

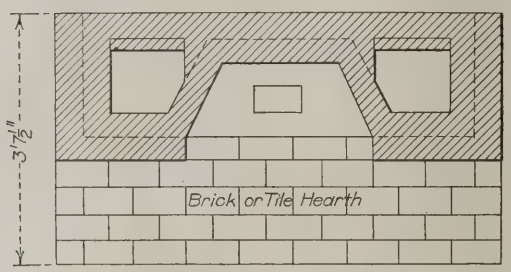
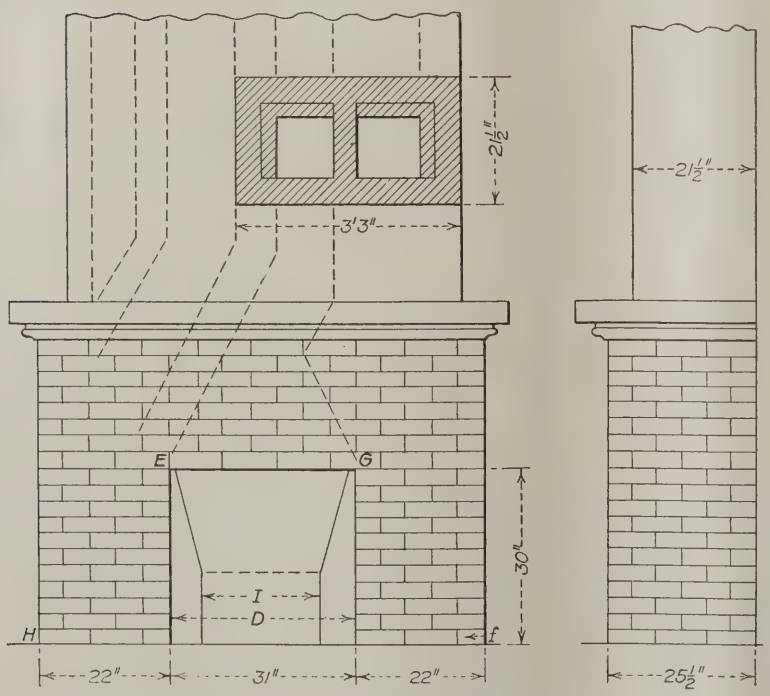


Fig. 2—Plan of Fireplace



Figs. 3 and 4—Front and Side Elevations with Cross Section of the Flues—Scale ⅜ In. to the Foot

The throat should have just one-half the capacity of the fireplace opening. This would make the throat of the fireplace here shown 2½ x 31 in. Above the throat the brick work should be drawn in from the sides to the proper size of the flue and can be deflected either to the left or the right, but should not be at a less angle than 60 deg.

The pressed brick in the mantel shown are 2⅜ x 4⅛ x 8⅝ in. and would require for the mantel and hearth very close to 250 brick.

If the chimney is carried up from the basement floor about 38 ft. with two flues all the way up and the chimney breast as shown to the first story ceiling, then there would be required about 5500 common brick.

The mantel shelf is to be put on and secured in place without inserting any wood blocks in the brick work.

The size of the fireplace if increased 4 in. in the width would give a more symmetrical bonding to the brick work. Referring to the upper left hand corner of the fireplace opening in the front elevation shown in Fig. 3, the brick "E" would then corbel over the opening the same as at "G" and the lower left corner "H" would start the same as at "F" shown at the right.

SHINGLING A CONE SHAPED ROOF

From W. A. W., West Liberty, Iowa.—I would like to have some of the readers tell me through the correspondence department the best method of covering a cone-shaped roof with asphalt shingles. The roof is 11 ft. at the base with a rise of about 6 ft., and is perfectly round.

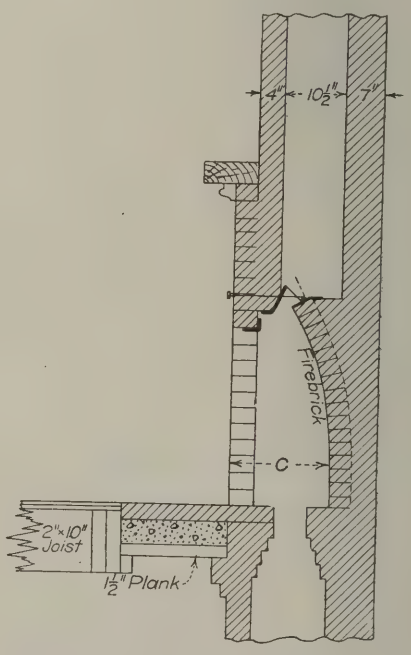


Fig. 5—Vertical Cross Section Showing Construction—Scale ⅜ In. to the Foot

MISCELLANEOUS DETAILS OF BRICK FIREPLACE CONSTRUCTION

The throat should extend the full width of the opening and not exceed in capacity that of the smoke flue. Some fireplace builders say that the

A Frame House for Two Families

A Design Which the Builder Is Likely to Appreciate—Some Practical Details of Construction

MANY prospective builders desire to have the comfort and convenience afforded by the ownership of a home, but hesitate to assume the ever-present financial obligation necessary for the upkeep. To such, the two-family house presents attractive possibilities, for if it is conveniently planned the renting of one apartment will greatly reduce the expense of upkeep and often even eliminate it.

Of the two general types of two-family house, the one divided vertically, and known as a twin house, is here illustrated. The first-floor plans are dissimilar. In one, dining room and living room open into each other; in the other the two are separated by a hall. The second and third floors are similar, each containing three bedrooms and bath on the second floor and a bedroom and two storage rooms on the third floor. Economy of plumbing is effected by keeping the bathroom over the kitchen, this portion of each apartment being adjacent.



Photographic View Showing the Street Approach From One of the Main Entrances

The footings are of a 1:2:4 concrete mixture 8 in. thick, and 12 in. wider than the foundation walls. The latter are built up of local stone. On the right side and at the rear, where the natural grade is toward the building, a coat of cement plaster was applied from the footing course to the finished grade.

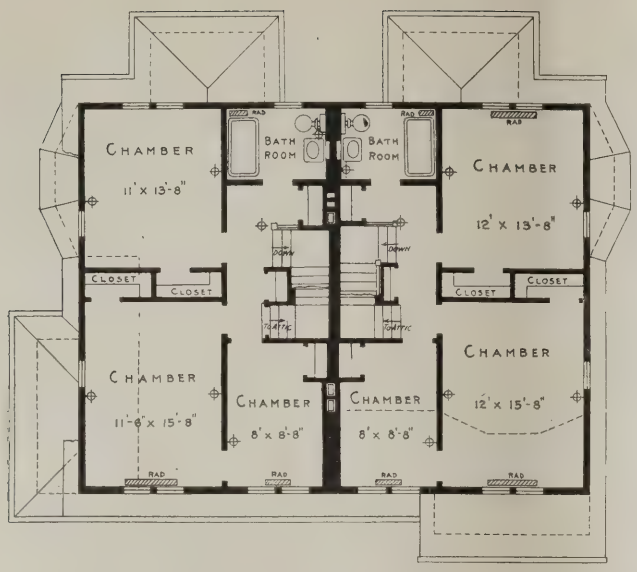
The party wall in the cellar is of stone, brick being used for the division of the rest of the house, the brick being furred with 1 x 2-in. strips. The cellar floor is composed of a 1-in. top dressing of Portland cement and sand applied over a 4-in. layer of concrete. Lally posts of 4-in. diameter are set on footings 12 in. thick and 2 ft. square. Girders are of long-leaf yellow pine 6 x 8 in. Separate chimneys of red brick with a 6-in. Portland cement cap are provided for each apartment, the heating equipments being kept separate.

The framing is of spruce. Sills and posts are 4 x 6 in., the former being laid flat; the floor joists are 2 x 9 in., placed 16 in. on centers, the joists being doubled under partitions. The attic ceiling beams are 2 x 4 in., placed 16 in. on centers and nailed to the rafters; plates are 2 x 4 in., doubled,

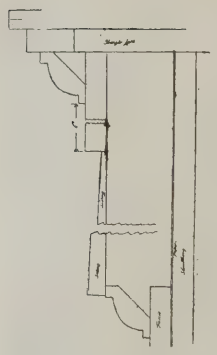
the outside studs and those used for bearing partitions are 2 x 4 in., placed 16 in. on centers, 2 x 3-in. partition bridging being used on all bearing partitions. Other studding is 2 x 3 in., placed 16 in. on centers and set flat; rafters are 2 x 6 in., ridge boards 2 x 9 in. Headers and trimmers are doubled and all openings over 3 ft. are trussed.

The roof is covered with "Creo-Dipt" Perfection 18-in. shingles, laid over 1 x 2-in. shingle lath placed on 5½-in. centers. Cornices have soffits of ⅞ x 3½-in pine.

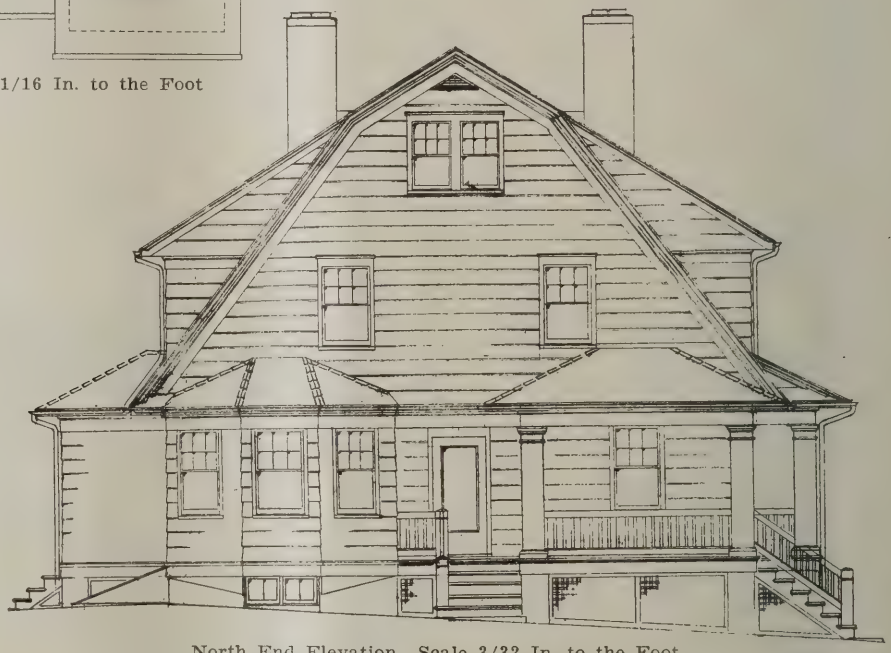
The sheathing is ⅞ x 6-in. tongued and grooved North Carolina pine, laid horizontally. Over this was placed Neponset black building paper, which received ¾ x 12-in. Maltese brand colonial siding,



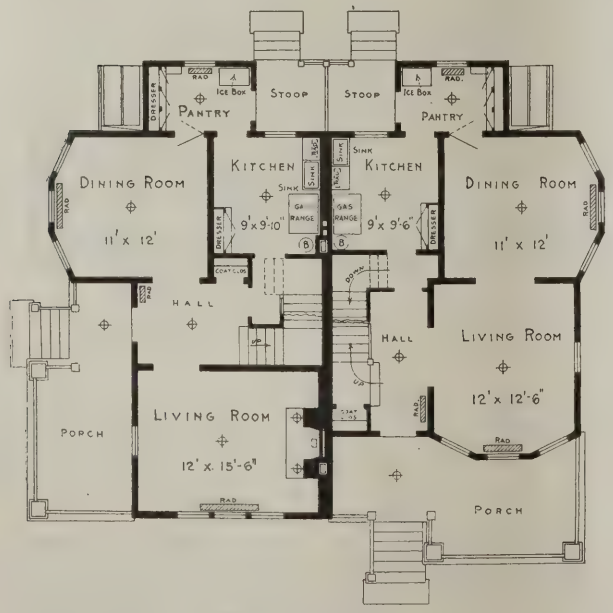
Plan of Second Floor—Scale 1/16 In. to the Foot



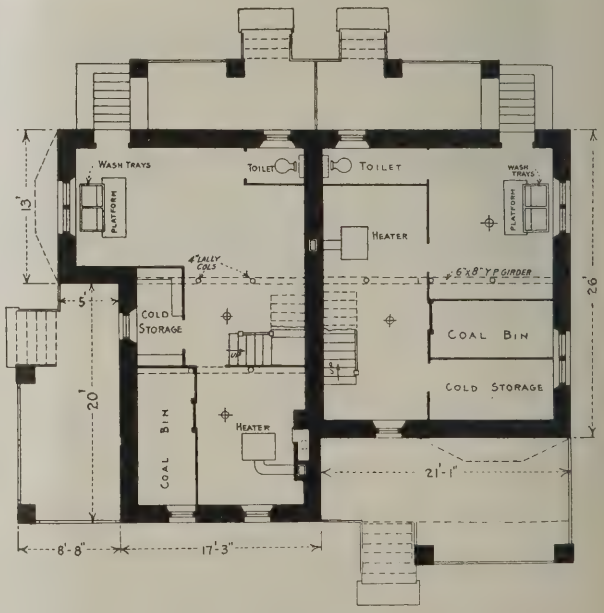
Details of Dormer Cornice—Scale 1½ In. to the Foot



North End Elevation—Scale 3/32 In. to the Foot



Plan of First Floor—Scale 1/16 In. to the Foot



Foundation Plan—Scale 1/16 In. to the Foot

PLANS, ELEVATION AND DETAIL OF TWO-FAMILY FRAME HOUSE

exposed 10 in. to the weather. This received three coats of white paint.

The porch floor joists are 2 x 9 in., placed 16 in. on centers. The floors are 1¼ x 2½-in. tongued and grooved yellow pine, with the joints laid in white lead paint and given two coats of paint at completion. Soffits and ceilings are of ⅞ x 3½-in. pine, given one coat of linseed oil and two coats of exterior spar varnish. The top and bottom rails are 3 x 5 in., balusters are 1½ x 4 in., placed 6 in. on centers, newels are 8 x 8 in. The steps are of yellow pine.

The front-entrance doors are of oak with a plate-glass panel, and were given one coat of oil stain, a coat of filler, and two coats of outside spar varnish. The rear porch doors are of white pine, with six lights, and were given a coat of stain and two coats of exterior spar varnish.

Inside doors are of birch, of a two-panel type, and were given a coat of stain and two coats of hardoil, eggshell finish. The attic doors are of cypress, and were given one coat of shellac and two coats of hardoil.

The plastering consists of two coats of pulp plaster applied over Sackett's plaster board, a hard-finish coat of lime putty and plaster of Paris being applied.

The halls are of chestnut trim, which was given a coat of filler, a coat of oilstain, and two coats of hardoil, eggshell finish.

The main stairs have 1¼-in. oak treads. Chestnut is used for the 1¼-in. strings, 1-in. risers, 2¼ x 4-in. rail, 1¼ x 2¼ plain balusters, two to a tread, and 5 x 5-in. paneled newels. The landings are of oak, which, together with the treads, received a coat of paste filler, a coat of stain, and two coats of liquid granite. The cellar and attic stairs are of North Carolina pine.

The floors throughout are double. Over a subfloor of ⅞ x 6-in. North Carolina pine was laid resin-sized building paper, which in turn received ⅞ x 2½-in. comb-grained North Carolina pine. The finished floors received a coat of oil and two coats of liquid granite.

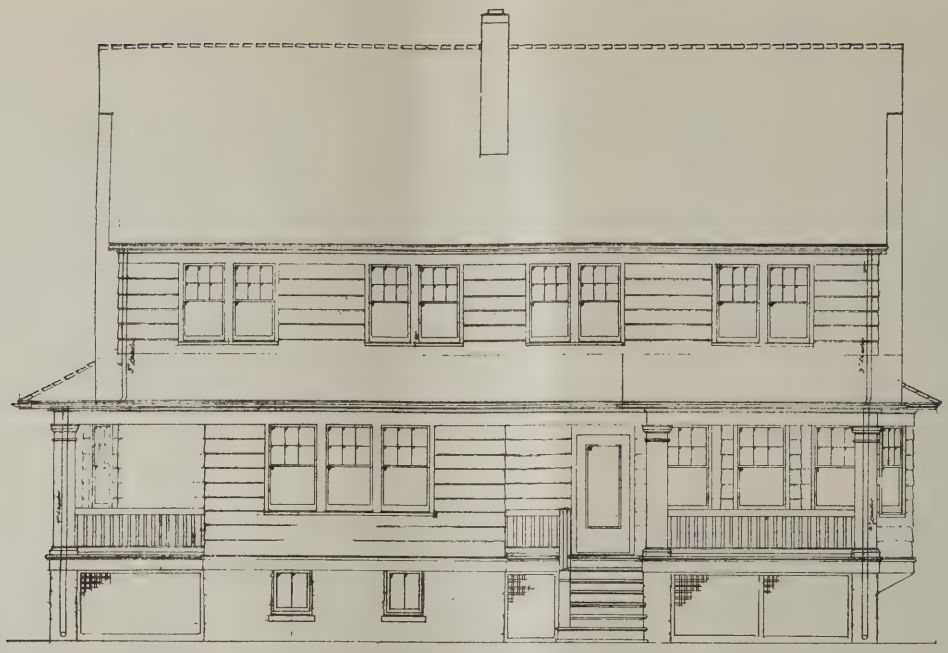


A Look Into the Dining Room Through the Cased Opening of the Living Room

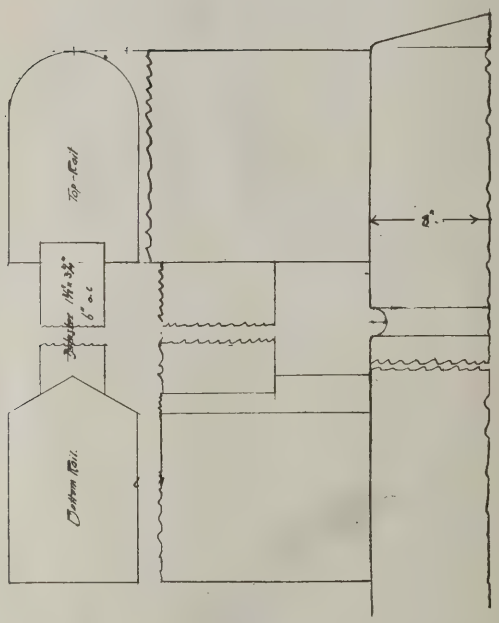
Deafening, consisting of lime putty, was put in 4 in. below the top of the joist where the first story overhangs the foundation, in the second-story overhang, and in the pantries.

The interior trim is of gum. In the south-side apartment the living room and dining-room trim was given three coats of white paint. The dining rooms have a plate rail 5 ft. 9 in. from the floor.

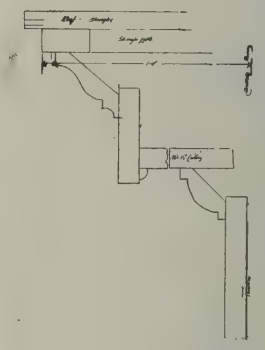
The living room on the north side has a fireplace of white stucco applied over brick, and a hearth of red hydraulic pressed brick. This fireplace is an example of the practical value of BUILDING AGE,



Front or West Elevation—Scale 3/32 In. to the Foot



Details of Porch Railings and Newels—
Scale 1½ In. to the Foot



Details of Gable Cornice
—Scale 1½ In. to the Foot



Right or South Elevation of the House Showing the Bay Window of the Dining Room.

Scale 3/32 In. to the Foot

ELEVATIONS AND CONSTRUCTIVE DETAILS OF TWO-FAMILY FRAME HOUSE

for the architect obtained the idea from the paper several years ago, and has used it frequently with great success.

The kitchens and pantries have cypress trim. The walls are painted 3 ft. 6 in. high. The sinks are of "Standard" make, 18 x 30 in. Each kitchen has a gas range and a gas heater.



Photographic View Showing One of the Family Entrances; Also the Garage

The bathrooms have tiled floors and tiled wainscots 4 ft. 9 in. high. The water closets have seats and lids of white celluloid.

Electricity is used for lighting purposes. Each family has a separate heating equipment, consisting of a Richardson Vapor-Vacuum-Pressure System, the boilers being Spencer Sectional Steam Heaters, covered with asbestos cement applied in three coats to a thickness of 1½ in.

This twin house was built for Mrs. Frieda Nielsin in Stephenson Park, New Rochelle, in accordance with plans and specifications prepared by Architect August Sundberg, 78 North Avenue, New Rochelle, New York. The contractor executing the carpentry and masonry work was M. A. Staus, 192 Main Street, New Rochelle, N. Y.

The colored supplemental plate showing the finished house and its surroundings will be found facing the next page of this article.

A Safety and Sanitation Exposition

What is designated as a Safety and Sanitation Congress has been called to take place in New York City Sept. 10 to 15, and in connection therewith will be an exposition to which three floors of the Grand Central Palace will be devoted. It is the intention to present thousands of safety devices and demonstrations of accident prevention, which will make it the largest Safety and Sanitation Exposition in history. The keynote at the sessions of the Congress will reflect its one object—to so educate employers of labor throughout the country that their attitude toward the conservation of workmen may become thoroughly receptive and that through concerted efforts the safety movement during the war will receive an impetus as never before. Men of national repute will put before the managers and superintendents of the various industries salient facts as to the vital importance of man-power conservation and insistence upon a speedy and successful termination of the war.

Raising a Heavy Roof

The following account of a most interesting job of roof raising appeared in a recent issue of one of our London contemporaries, the roof in question covering a large bakery:

"The roof is 218 ft. in length by 47 ft. in width, made up of twenty-three steel trusses, four steel hips, and six half-trusses to hip ends, with heavy lanterns 194 ft. in length on steel frames on each truss and rising 5 ft. The lantern is glazed all round with pivot hung sashes. The roof and lantern are covered with slate, except about one-third on the north side, which is glazed with ⅜ in. rough plate on lead-covered steel bars. The whole weight is about 250 tons.

"Through the roof there projected three 3 ft. by 3 ft. 9 in. chimneys, and one main stack 8 ft. square with six 8 in. C. I. flue pipes entering into the main stack, which connections were constantly in use, and passing over ties of trusses.

"The roof was the middle one of three, and before anything could be lifted trusses had to be freed from girders to which they were bolted, valley gutters cut away, new gutters formed, slating made good to two side roofs, and temporary eaves gutters provided to the center roof, so that as little water as possible might be let in on ovens and stores in case of rain. In fact a lot of rain fell in very violent showers while the roof was being raised.

"Two temporary wood trusses had to be made up half-way up the hip end to take the place of walls



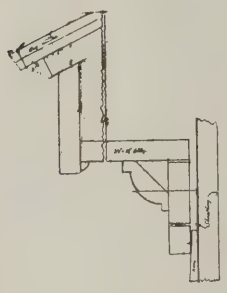
View in One of the Living Rooms of the Two-Family House Forming the Basis of Our Colored Supplemental Plate

which were to be done away with, and had been filling the place of trusses. Bearings for jacks had to be taken 13 ft. below girders until the roof was raised sufficiently to insert jacks clear of girders and gutters (about 4 ft.), when the jacks were placed on the walls, the roof raised and brickwork built up to it in stages, until the whole was raised 15 ft. above the original bearing and secured.

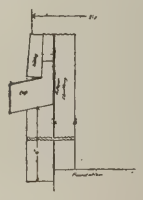
"The walls were only 14 in. thick, without any cross walls. There are twenty window openings—7 ft. 6 in. by 3 ft. 9 in., two ditto 7 ft. 6 in. by 4 ft. 6 in., doorway 8 ft. 6 in. by 5 ft., with seven blank windows set in 4½ in. This practically cut the wall into piers, making it a decidedly delicate job to move so much weight to such a height. Only thirty nominal 10-ton I-pattern screw jacks were used.

New System of Church Lighting

In the lighting of some churches of the basilica type in Chicago and vicinity, a rather novel form has been brought into use which is said to solve the difficult problem of the application of modern illuminants to such churches. The problem has been met by a combination of direct and indirect lighting, the lamp being arranged in a specially designed moulded cornice running on either side the entire length of the building. The cornice is hollow and the direct lighting is afforded by lamps in appropriate reflectors mounted in the under side. Above, special units throw additional light on the ceiling and show off its ornamental nature. All the lights are out of the range of vision and are easily accessible from a chamber running the length of the church immediately behind the moulding.

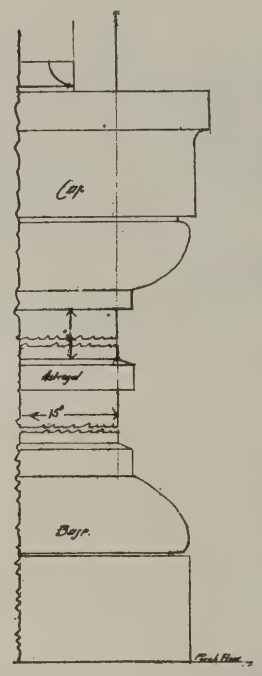


Details of the Main Cornice



Details of the Water Table

Scale 1½ In. to the Foot



Details of Porch Columns—Scale 3 In. to the Foot



Rear or East Elevation Showing Separate Entrances—Scale 3/32 In. to the Foot

ELEVATION AND MISCELLANEOUS CONSTRUCTIVE DETAILS OF TWO-FAMILY HOUSE



BUILDING AGE
NEW YORK

Brief Review of the Building Situation

Figures Showing Building Activities in Various Sections of the Country in July, 1917, and July, 1916

ONE of the most noteworthy features of building operations for July, 1916, was the large increase of 72.5 per cent over the same period of 1915, due mainly to the rush to file plans in the borough of Manhattan before the zone law went into effect. This unnatural increase makes the loss of 49.47 per cent in 121 cities reporting for July, 1917, as compared with July, 1916, of much less significance than at first appears, for the Eastern section of the country is the only one showing more than a comparatively small loss.

Eliminating Manhattan from the figures for the entire country gives a loss of a fraction over 15 per cent. Figures for the Eastern section of the country are given below:

CITIES IN EASTERN STATES

	July, 1917	July, 1916
Allentown	$106,230	$62,280
Altoona	78,697	71,221
Atlantic City	45,044	73,383
Auburn	39,576	29,335
Binghamton	133,374	144,831
Boston and suburbs	4,310,000	4,912,000
Bridgeport	334,020	464,157
Brockton	159,240	104,612
Buffalo	1,472,000	1,135,000
East Orange	109,635	225,859
Elizabeth	78,138	121,305
Erie	224,209	255,781
Harrisburg	113,860	90,215
Hartford	317,130	363,756
Hoboken	23,800	95,623
Holyoke	31,185	97,400
Irvington	41,030	55,075
Lawrence	26,150	58,650
Manchester	48,969	87,511
Newark	627,241	577,345
New Bedford	70,850	269,425
New Haven	444,912	266,275
New York:		
Manhattan	1,894,095	49,205,220
Bronx	929,247	1,283,266
Brooklyn	1,975,406	2,522,105
Queens	673,125	1,406,700
Richmond	124,650	515,723
Niagara Falls	181,285	146,593
Passaic	54,600	122,917
Paterson	96,237	417,139
Philadelphia	5,195,365	3,101,685
Pittsburgh	1,375,752	966,296
Portland	125,225	97,970
Quincy	195,258	267,330
Reading	58,275	164,075
Rochester	574,548	1,078,864
Schenectady	396,045	392,249
Scranton	52,723	171,706
Springfield	170,382	427,295
Syracuse	222,560	321,664
Trenton	114,631	114,985
Troy	25,210	66,590
Utica	78,525	157,900
Wilkes-Barre	59,234	185,580
Worcester	309,928	526,545

The middle section of the country shows a loss of 19.91 per cent, 24 out of 38 cities contributing to this result:

CITIES IN MIDDLE STATES

	July, 1917	July, 1916
Akron	1,117,958	756,425
Canton	216,705	341,440
Cedar Rapids	189,000	128,000
Chicago	4,204,100	8,076,800
Cincinnati	707,615	786,350
Cleveland	2,667,530	2,397,660
Columbus	268,435	563,085

CITIES IN MIDDLE STATES (Continued)

	July, 1917	July, 1916
Davenport	62,053	123,060
Dayton	257,674	350,805
Des Moines	97,110	138,383
Detroit	4,187,220	4,623,675
Dubuque	34,980	84,800
Duluth	315,521	172,240
East St. Louis	34,050	51,450
Evansville	71,212	244,200
Ft. Wayne	675,200	289,500
Grand Rapids	180,885	246,822
Indianapolis	516,804	818,175
Kansas City, Kans.	57,480	51,940
Kansas City, Mo.	1,040,740	1,108,140
Lincoln	74,875	157,275
Milwaukee	979,906	2,091,401
Minneapolis	979,435	1,913,175
Omaha	656,250	584,675
Peoria	568,480	166,435
Saginaw	13,275	63,965
St. Joseph	124,425	11,425
St. Louis	1,352,203	1,541,421
St. Paul	1,014,634	782,224
Sioux City	270,965	299,150
South Bend	282,163	97,652
Springfield, Ill.	69,080	103,100
Superior	195,420	71,155
Terre Haute	61,984	67,740
Toledo	361,055	565,492
Topeka	47,280	101,893
Wichita, Kans.	59,234	185,580
Youngstown	357,180	274,800

The Southern section of the country shows the smallest loss of any of the various sections into which we have divided the country, there being a falling off of only 9.9 per cent.

CITIES IN SOUTHERN STATES

	July, 1917	July, 1916
Atlanta	330,846	200,717
Baltimore	888,992	618,218
Birmingham	242,508	141,418
Charlotte	53,485	58,156
Chattanooga	89,489	39,984
Dallas	145,720	268,176
Ft. Worth	64,596	257,220
Jacksonville	709,650	214,275
Huntington	49,993	102,100
Louisville	166,930	203,550
Memphis	274,670	261,405
Montgomery	15,395	40,481
New Orleans	818,573	381,126
Norfolk, Va.	118,558	103,612
Oklahoma City	233,525	185,575
Richmond	182,841	269,169
San Antonio	126,370	604,890
Savannah	34,200	132,095
Tampa	138,697	79,425
Washington	644,670	1,814,753
Wilmington	326,525	303,112

The Western section of the country shows a loss of 19.6 per cent, 9 cities reporting a gain and 8 a loss.

CITIES IN EXTREME WESTERN STATES

	July, 1917	July, 1916
Berkeley, Cal.	204.500	121,350
Colorado Springs	7,110	55,025
Denver	217,400	348,770
Los Angeles	1,063,808	909,056
Oakland	345,085	357,126
Pasadena	202,527	153,371
Portland	358,955	368,525
Pueblo	62,605	9,810
Sacramento	65,298	176,239
Salt Lake City	194,700	192,325
San Diego	78,485	71,673
San Francisco	917,850	1,497,279
San Jose	27,898	19,232
Seattle	475,190	1,107,160
Spokane	258,330	147,470
Stockton	110,829	44,629
Tacoma	72,941	84,936

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

SEPTEMBER, 1917

Conference on the New York Building Situation

As we go to press with this issue of the paper a movement is being launched to bring together for a conference on the New York building situation contractors, architects, real estate men, building material and equipment supply men, insurance and title representatives and others likely to be interested. The idea is to bring together all construction interests in the metropolitan district covering a radius of 56 miles from New York City, the meeting to be held under the auspices of the Building Material Exchange of New York, of which Elliott Smith of the well-known firm of Candee, Smith & Howland is president. The Exchange has appointed a committee of four to compile current building statistics and price comparisons covering building materials in the New York market and to arrange a general conference to determine if possible "why building construction should not be permitted to proceed." This will afford opportunity for a free discussion by all interests concerned and for an expression of views on a matter which at present is absorbing a great deal of serious attention, not only locally but by builders and material men in other parts of the country. The chairman of the committee of four—C. J. Curtin, a former president of the Exchange—expresses the belief that an "investigation of the fundamental causes of the slump in building construction in New York is not only timely, but important." He says the committee expects "to show that building material costs are not so high but that the new 15 to 28 per cent increases in rents in the city and vicinity cannot return a profit to realty interests." He also wants to check the impression "that building materials are going to return in price to levels prevailing two or more years ago. It is also important for the financial interests as well as the owners to know officially what the reasons for the present prices of materials are and just how building materials can be placed within reach of builders at prices commensurate with current prices on raw materials." As Mr. Curtin puts it, these are times for serious thinking men to get together and find a war-time plane for business expression and activity.

Non-Fireproof Garage Construction

In view of the heavy demand for housing accommodations for automobiles, motor trucks, etc., municipal authorities as well as architects and builders in all the leading centers of the country will be greatly interested in the amendments to the New York Building Code which have just been completed by the Board of Standards and Appeals in connection with a recently adopted ordinance permitting the erection of non-fireproof four-story garages and the legalizing of existing converted garages. The amendments are intended to cover all materials entering into the different forms of fire-retarding construction. The definition of what constitutes work of this nature is given as "any material or form of construction that resists the action of flame and heat when subjected to a continuous fire for one hour at an average temperature of 1700 deg. Fahr. without the passage of flame, and with a maximum temperature rise to 400 deg. Fahr. on the side away from the fire."

Floor Construction

One of the proposed amendments relates to wood-joisted floor construction which, to be regarded as fire-retarding, shall have the beams protected on the upper and under sides with the materials specified in the rules for floor and ceiling coverings. Several forms of construction are accepted as fire-retarding in both cases, and afford opportunity for a choice by the architect and the builder. For

covering the upper sides of wood floor beams in joisted-floor construction in non-fireproof buildings used as garages, motor vehicle repair shops or oil-selling stations, the builder may use 7/8-in. wood underflooring protected with a layer of waterproof paper or felt and a membrane of two-ply waterproofing covered with 2½ in. of concrete reinforced with steel mesh extending longitudinally and transversely; or the builder may use "7/8-in. wood underflooring protected with a membrane of three-ply waterproofing flashed to a height of at least 3 in. at walls, shaft inclosures and columns and covered with not less than 2 in. (1¾ in.) dressed, tongue and groove planks."

Ceiling Treatment

In the case of ceiling covering three forms of construction are described, any one of which shall be accepted as fire-retarding for the covering for the undersides of wood floor beams in buildings of the character already named. The first form consists of ½-in. plaster boards with pointed joints covered with No. 26 gage sheet metal with 1-in. lapped seams nailed to the wood beams when spaced not more than 16 in. on centers, or nailed to furring strips when the floor beams are spaced more than 16 in. on centers. The second form of construction consists of two thicknesses of ¼-in. asbestos boards laid with tight staggered joints and nailed to the beams, when spaced not more than 16 in. on centers or nailed to furring strips when the floor beams are more than 16 in. on centers. The third form consists of No. 24 gage metal lath attached to furring strips and plastered with Portland cement mortar at least ¾ in. thick.

The proposed amendments relating to columns and girders call for them to be protected with the fire-retarding materials specified for ceiling coverings and standard mill construction is to be accepted as the equivalent of fire-retarding construction in non-fireproof buildings used as garages.

New Exhibition to Supersede Annual Cement Shows

The first Cement Machinery and Building Material Show will be held in the Coliseum, Chicago, Ill., opening at 8 o'clock on the evening of Wednesday, Feb. 6, and closing at 10.30 o'clock on the evening of Wednesday, Feb. 13, 1918. It is planned to take the place of the annual Cement Show which, as announced in our last issue, will not be held the coming February. The new show will be conducted under the auspices of the National Exhibition Company, 123 West Madison Street, Chicago, Ill., and with few minor exceptions will be handled in the same manner as the last Cement Show. The one important change instituted by the new show is that machines and products of interest to builders even though they do not relate to concrete will be permitted. It has been felt that the sameness of Cement Show exhibits for the past few years has had a tendency to lessen the interest of builders in the shows, and the broadening of the scope of the new exhibition should have a tendency to counteract this and materially increase the interest of builders in the undertaking.

Practically the same rules which governed the last Cement Show will govern the coming exhibition. Vigorous efforts will be made to secure meetings during the period of the show of such organizations as the National Builders' Supply Association, the Illinois Lumber and Builders' Supply Dealers' Association, the American Concrete Pipe Association, the American Concrete Institute, the American Association of Engineers, etc.

The same co-operation from the railroads entering Chicago, also the hotels, theaters, department stores and the Chicago Association of Commerce may be counted upon to bring visitors to the show. It was felt last year that the Cement Show was not given sufficient publicity in the trade papers, and a wider plan of trade paper promotion is contemplated.

The same space arrangement followed at the last Cement Show will be utilized again, the equipment used at the Coliseum last year having been purchased for the coming show.

Watermelon Feast of Cleveland Builders' Exchange

An attendance of 250 prominent building contractors and dealers characterized the quarterly meeting and annual watermelon feast of the Builders' Exchange of Cleveland, Ohio, held on August 8th. The Exchange had as speaker Lieutenant Eugene C. Roberts of the Canadian Light Artillery, who gave a highly interesting account of his experiences as an officer in active service in the world war. Lieutenant Roberts appeared in uniform and was introduced by Brigadier-General Charles X. Zimerman of Cleveland, who was also a guest on this occasion. A bountiful supply of ice-cooled watermelons featured the luncheon.

A brief business session was held at which a nominating committee to select candidates for directors of the Exchange in the election next November was chosen. The Cleveland Exchange is to hold a celebration in honor of its twenty-fifth anniversary early in November.

The annual outing of the Carpenter Contractors' Association was held on August 15th at the Dover Inn, a country resort near the city. Members of the association assembled at the Exchange early on the afternoon named and proceeded to the Inn in automobiles. The afternoon was occupied by a program of athletic sports and a period of jollity followed the serving of an old-fashioned chicken dinner at 6 o'clock.

BUILDING AGE

THE DEALER'S DEPARTMENT

The Silo, or the Farmer's Friend

The Silo Business Should Belong to the Retail Lumberman—Some Pertinent Comments

By C. E. Davidson

SILOS have been very largely sold by what is known as the regular silo companies—those which do nothing the year round but solicit and deliver silos to the trade all over the United States. Their methods are to advertise heavily a particular type of silo, claiming some superiority of their make. All silos are pretty much the same in design, are, in short, standardized, except the doorway. This is the only feature of a silo which is patentable. Most of the silo companies are now doing business under the company which owns what is known as the "Harder patent." There are, in short, two Harder patents. The Harder patent, the original one, consists chiefly in claiming a new idea in a mere brace across the doorway, which holds the staves apart at the doorway and thus prevents collapsing. There is also a claim of patent on what is claimed as a continuous door, but there is, in fact, really no such thing. All silo doorways are made up of doors as much as the construction will permit. The system is to have agents in each county in each state. When a prospect is secured a traveling solicitor, who is well versed in silos, ensilage and its care in keeping, etc., is sent out to close the order, and he generally does, going at once to another field.

Where the Silo Business Belongs

I have always contended that the silo business belonged to the retail lumberman. Being a retailer, naturally I would take that position. But, of course, business belongs to the man who goes out after it, and that, I am sorry to say, the retailer does not always do. The ooze of the pine and scent of the fir, sometimes, I think, gives us retailers some sort of a hookworm. Big business comes to us, much of it, and we are contented thus to drift along. But the silo business is one which is naturally related to the lumber business, and the lumberman ought to handle it.

A silo, in a commercial sense, means only the staves or tub part, the bands, which encircle it, and the anchorage system. They are always thus priced. The buyer must yet buy cement for foundation and lumber for scaffolding, rafters and roof, and the connection of the silo and barn, and more often a lot of other material which is bought to complete the new arrangement and requirements of a silo.

What the Lumberman Sells

When a lumberman sells a silo he oftentimes sells a barn or enough shingles for a new roof, and so on. It pays him big. Several lumber companies and one or more sash and door houses now make a specialty of supplying retailers with staves and with rods, anchorage, etc. A few retailers are building concrete silos. Both types are used. I find German communities which like to build for all time prefer the concrete or the burnt tile type, while others prefer the wooden silo. Both have their good points and both have their poor ones.

I believe their relative differences are fairly stated about as follows: The concrete or burnt tile type is preferred by some because, as stated, they are thought to be more enduring and will not blow down during times of heavy storms. The only real objection of material worth, as I see it, is that the concrete silo, being porous, will admit air and thus cause the ensilage to spoil at the edges. But this may be corrected by using a waterproofing with the cement which I have recently seen advocated.

The Wooden vs. the Concrete Silo

The wooden silo is preferred by some because it can be erected in a day or two, costs less than the other type, and unless the concrete silo is well plastered or waterproofing used, will preserve the ensilage better as a general thing. A wooden silo will last a long time. The gases which preserve the corn stalk, which is a wood fiber, will no doubt

also preserve the wood, at least on the inside, which contains it. Of course, the wooden silo should be painted on the outside, and it should have a modern anchorage system to prevent winds from blowing it down.

Great progress has been made in the past two or three years by placing two steel bands, like on the outside, on the inside at top and bottom of silo, and these two inside rods being connected to the outside bands through the wood by U bolts, which bind the outside and inside rods together, with the staves, of course, between them.

Method of Handling

The proper and most economical method of owning a slio is for several farmers of a community to each buy a silo of some type—any type, so it is of the round kind. If no thresherman owns an ensilage cutter, which is now seldom the case in agricultural communities, then the only alternative left is for the several farmers to buy, as a company, a cutter. They go about helping each fill the other's silo. As a rule the company is at each place about one day. Corn binders which cut ten acres per day are used in most instances to cut down the corn, and it is hauled in on hay racks to the cutter. A week or so, in the fall, when the weather is pleasant, offers a strong incentive to harvest the ensilage crop, as against the more ancient way of waiting until the snow and ice are on the ground, when the farmers must chop out some "fodder," which is then of a very inferior feeding quantity.

Value of Ensilage as a Food

The Illinois Experiment Station several years ago issued a bulletin wherein, by tests and comparisons, it was enabled to say that 48 per cent of the nutritive food elements of corn was in the ear of corn and 52 per cent of food nutrients in the leaves and stalks. The better the corn the better the ensilage. The better the corn the greater the percentage of protein, the much needed flesh builder.

An old darkey once, in the writer's presence, described the superiority of ensilage in the following way: "Boss, they tell me dat an egg and a pound of beef are jist the same; but I say, gib me the pound of meat; I want de fillin'." And while the ensilage, plus the corn, is worth more than corn alone, yet ensilage has the added value of adding bulk, which the animal must have. No cow could produce milk on corn alone. She must "hab de fillin'."

Rules for Piling Lumber

Various Methods of Doing This Work in Order to Give the Best Results

RETAIL dealers throughout the country are interested in the proper method of piling lumber, and the following rules issued by the United States Department of Agriculture in Bulletin No. 552 entitled "The Seasoning of Wood" are worthy in this connection of more than passing notice:

1—Foundations (Endwise or Sidewise Piling)

(*a*) The foundations should be strong, solid and durable.

(*b*) The top of each foundation should be level, and from front to back the top surface of the parallel skids should be in alignment, so that the lumber to be piled will bear equally upon each one.

(*c*) The front foundation should be raised above the second, and the second above the third, to allow a slant in the stack of 1 inch to every foot.

(*d*) The foundations should be spaced not over 4 feet apart, except for heavy planks and timbers.

(*e*) The front foundation should be of sufficient height to provide space for free circulation of air under all parts of the pile.

2—Lumber (Endwise Piling)

(*a*) Skids, preferably 2 by 4 inches, should be laid on top of the foundations.

(*b*) Boards of equal length should be piled together.

(*c*) The ends of the boards should rest upon the front and rear skids.

(*d*) A space of approximately three-fourths inch should be left between boards in the same layer.

(*e*) Lumber piled in the open should have the front ends of boards in each layer slightly protruding beyond the end of the layer beneath, to give a forward pitch to the stack.

3—Lumber (Sidewise Piling)

(*a*) Skids, preferably 4 by 6 inches, should be placed across the foundations at about 4-foot intervals. The number of skids depends upon the thickness of the lumber.

(*b*) Boards of equal length should be piled together.

(*c*) The boards should be placed on the skids, with about three-fourths inch between boards in the same layer.

(*d*) Lumber piled in the open should have the front board in each layer project slightly beyond the board in the layer beneath, to provide a forward pitch to the stack.

4—Stickers (Endwise or Sidewise Piling)

(*a*) Stickers should be of uniform thickness, preferably seven-eighths inch for 1-inch lumber and 1½ inches for 2-inch lumber. Their length should be a few inches in excess of the width of the pile.

(*b*) Stickers should be placed upon the layer of boards immediately over the skids and kept in alignment parallel to the front of the piles.

(*c*) The front and rear stickets should be flush with, or protrude beyond, the ends of the boards.

5—Roof Protection (Endwise or Sidewise Piling)

Cover boards, as a roof protection, should be laid on the top of the pile, extending a few inches beyond the front and rear ends of the stack.

6—Spacing Stacks (Endwise or Sidewise Piling)

Space between the piles should not be less than 2 feet; 4 or 5 feet is preferred if yardage conditions permit.

7—Dimensions of Stack (Endwise or Sidewise Piling)

The customary width of stacks is from 8 ft. to 16 ft. The height is governed by the size and character of the lumber and by the methods of moving it.

8—Treated Ends (Endwise or Sidewise Piling)

The ends of lumber 2½ in. thick or over and that of the lower grade should receive a brush treatment of paint or some liquid filler.

The Bulletin states that the rules here given are based on information obtained through field investigations and from lumber manufacturers and wholesale and retail dealers and accord with the best lumber piling practice in general commercial use. Certain species of wood, however, require particular care in air-drying, and in this case slight variation from the rules are necessary in order to secure the best results. Some lumbermen in the South, for example, find that thick red oak checks badly on the ends and in air-drying such stock have adopted the scheme of protecting it with sun shields which they claim reduces end checking to a minimum.

Mills cutting red gum formerly experienced difficulty in drying the lumber on account of its tendency to warp. This objection, however, has been largely overcome by the exercise of care in seasoning. In erecting a pile of gum lumber, stickers are placed every 2 ft. apart, some lumbermen claiming that 18 in. is not too close to obtain the best result. Another scheme in more or less general use among gum lumber manufacturers is to construct the pile so as to have a flue or "chimney" in its center, thus providing ample air circulation vertically through the stack.

Hickory and ash lumber frequently check badly when air dried. Lumbermen in the Southern hardwood region have found that these checks will close up entirely if the lumber is first stuck-piled for six to eight months and then bulk-piled and protected by good covering, preferably sheds.

The Organ of the N. Y. Lumber Dealers' Association

The Lumber Co-operator is the title of an interesting and useful publication issued by the Retail Lumber Dealers' Association of the State of New York to keep its membership informed as to the miscellaneous activities of the organization. The *Co-operator* is issued bi-monthly, under the direction of a publication committee consisting of Alvah M. Stahl, W. F. Marvin, Wm. L. Hemrich and F. H. Phelps, the editorial work being taken care of by Secretary Paul S. Collier's office in Rochester.

In the July issue of *The Co-operator*, the association announced two new services for its members, a traffic department under the direction of E. E. Tomlinson, which will undertake to trace and expedite the handling of any shipment to a member of the association, and an advertising department, which will prepare advertising copy suggestions and furnish electrotypes for use in local newspapers.

The New York Association is actively engaged in promoting district organizations of dealers throughout its territory, and much other good work is reviewed in *The Co-operator*. The magazine is new, but met with surprising initial success, and is carrying a gratifying volume of advertising of some of the best manufacturing and wholesale concerns in the business.

Meeting of Ohio Builders' Supply Men

The summer attractions of Cedar Point and the opportunity of extending personal acquaintanceship combined to make the annual meeting of the Ohio Builders' Supply Association unusually well attended this year. The meeting was held on July 26 to 28 with headquarters at the Breakers Hotel.

The program which provided more of pleasure than of business kept the time of the visitors well occupied for three days. It happened that the thermometer was high up in the tube and bathing parties were the order of the day. Only one business session was held and this followed a social dinner in the convention assembly hall. At this dinner a very interesting address was delivered by H. P. Sandles, former State Secretary of Agriculture, who emphasized the necessity for good roads. Mr. Sandles gave three reasons why farmers were moving to the cities, these reasons being bad roads, poor schools and poor churches. Chief of these he said was the faulty highway. He remarked that this disadvantage was both father and mother of the other two. He urged the building supply men to advocate better roads to meet the modern requirements including the use of motor trucks. An address was also made by Arthur Black of the American Gypsum Company.

A new constitution was adopted for the association providing for some radical changes in the manner of administrating its affairs. Among other things the plan calls for a division of the state into districts and the placing of a chairman at the head of the sub-organizations of supply dealers in each of these divisions. The financial plan was also revised so as to provide for the payment of annual dues based upon the amount of business transacted by each individual member, the lowest class being $10 and the highest class $50 a year. A Board of Arbitration was authorized to adjust differences which may arise in the conduct of business between dealers and manufacturers and also among the dealers themselves.

The next business meeting may be held in Columbus, an invitation from that city having been received at the "outing" and referred to the committee for consideration.

The president of the association is W. O. Holst of Toledo and the executive officer is H. S. Gaines of Columbus who serves in the capacity of assistant to the president.



Impressions of a Building Age Traveler

An Interesting Explanation of an Item in the Traveler's Expense Account

EDITOR BUILDING AGE: Your letter in which you ask about the $3.00 for livery hire in last week's expense report, came to hand this morning. It will take me all morning to write you about it because it's a long story. But it's awful hot and I'd rather sit here in the cool and write, than tramp around in the heat anyway, so I may make it even longer than necessary.

It happened like this. I was in a dealer's office out at ..... (I can't give names as I left everybody interested good friends) when a traveling man for the manufacturer of a well known building specialty came in. The dealer got prices and then told him to come back after dinner and he would give him an order provided he didn't see anyone else in the town.

After the traveling man left, the dealer told me he had had a call for that very material about a week before, but as he didn't know where to get it, or anything else about it, he had done nothing. Then he called his customer on the 'phone, quoted him, and secured his order, remarking incidentally that he had "made a good sale."

This transaction interested me to such an extent that I decided to satisfy my curiosity and get the whole story. I had heard the customer's name and learned that he was a farmer living about 5 miles out of the town which has a population of about three thousand. The question that came to my mind was why this farmer should order something about which his local dealer knew nothing, and then wait a week without knowing whether he was going to get it or not. The only way I could get an answer to this question was to see the farmer. Of course, this was all to satisfy my own curiosity, but the opportunity to drive a good horse through the beautiful country on a fine day seldom presents itself in this day of Fords, and I fell for it.

Being a farmer myself, we soon got on intimate terms and this is what I learned from him. He needed this material for making some repairs. He had been wanting to make these repairs for several years, but knew of no way to do it without involving a lot of expense and trouble. Then he saw this material advertised in his farm paper, with a description of just how he could use it and accomplish his repairs with very little inconvenience and less expense than he had been able to figure with anything else.

I asked if he had written to the manufacturer, and he said, "No, the 'ad' said he could get it from any dealer in building supplies, so he had gone to the dealer for it." Inquiry developed also that several of his neighbors could use the same material in the same way and to the same advantage that he proposed to use it.

I met the traveling man again at the hotel at noon and told him I was going to take a drive out into the country. He said he would like to go along, as he couldn't get out of the town until 6 o'clock and had only one call to make in the meantime. But he felt pretty sure of an order. When I got back from my drive and started for the 6 o'clock train, there was Mr. Travelingman, all smiles. He had his order. I asked him if it was a large one, and he told me how much. It was exactly the quantity the farmer had ordered from the dealer. He, like the dealer, told me he had "made a good sale."

They are both honest. The dealer really felt that he had made a sale to the farmer, and the traveling man in turn really felt that he had made a sale to the dealer. And when the sales manager for the manufacturer got the traveling man's report, he no doubt gave him a plus mark for doing a good day's work in getting an order of that size out of such a small town. Yes, they are all honest about it. Each one thinks he sold something, but nothing of the kind happened. Not one of them, the dealer, the traveling man or the sales manager did a whit of selling on that transaction. They simply let the other fellow *buy*.

The advertising manager for the manufacturer is the only man in the whole lot who did anything toward producing that order, and he didn't do his full duty. He prepared and published an advertisement which portrayed the merit, use and method of application of this material so vividly and so forcefully that it induced a desire to possess it on the part of the farmer. But this manufacturer distributes through dealers, so the farmer was told to go to the dealer to make purchases.

The dealer didn't know anything about the material or how to use it to advantage. Small space had been used in several trade papers calling attention to the product in big bold type, and telling the dealers to write for particulars, but no trade paper advertisement told the dealer what the farm paper told the farmer. No specific suggestion as to the uses for the material to stimulate the dealer in sales effort or guide him in presentation to his customer had been included in the trade paper copy. That is where the advertising manager slipped up in the "copy" and space in the trade papers.

If this particular dealer had been aggressive and really tried to sell goods instead of simply waiting for someone to come and buy, he would have found out what the farmer wanted to use this material for and sold him something else, and the good work of the advertising manager with the farmer would have been lost, simply because he had not prepared the dealer to handle the customers the general advertising would send to him.



"And the Traveling Man Really Felt That He Had Made a Good Sale to the Dealer."

Then take the traveling man; I haven't referred to him as a salesman because he didn't prove to be one in this instance. He was simply a traveling man. If he had really been a salesman he would have pointed out to this dealer the different uses and advantages of this material and would have show him its sales possibilities; but he didn't. I was there. He told simply how much better the product was than others he mentioned. He said nothing about the many conditions under which it

could be used to advantage or the profit to the dealer in pushing its sale. The dealer didn't know this particular product was made, or anything like it, but this traveling man informed him in his talk where he could get another make or brand, "but, of course, not as good."

Where the Salesman Was at Fault

Why didn't he start in and show how to sell his product instead of telling where something else of like character could be procured? Why? Because the manufacturer needs another sales manager! Don't put all the blame on the poor traveling man who is trying to be a salesman, but go back to the sales manager, whose duty it is to train him and to see that he is a salesman before he sends him out.

The salesman should be able to present personally to the dealer everything the advertising manager says to the consumer, plus ability to so enthuse the dealer that he can and will go out and find the consumer. When you listen to the presentation of some propositions to dealers by manufacturers' so-called salesmen, you don't wonder so much that dealers are so little interested.

What the Dealer Buys

And then we come to the dealers. This particular dealer, unfortunately, is not a salesman or a merchant. He's simply a dealer. He buys what the people of his community have been in the habit of using, and trusts to the weather and the crops that someone will come to buy it of him. He does not sell anything. He doesn't look around in an effort to find what is needed in his territory and then go out and sell it. If he did, he would have sold six orders of this particular material to six different farmers whose buildings I passed that afternoon on my way to the farmer who had seen the ad in his farm paper.

Why Dealers Are So Modest

Why is it so many dealers in building supplies, and lumber dealers particularly, are so modest? The dealer in farm implements will drive all over the country to solicit orders for farm machinery, but the lumber dealer will see that same machinery stand out in the weather and rust and never think of trying to sell the farmer a shed in which to house it! I know hardware merchants who watch farm buildings to find out when and where paint is needed, and then at the right time and in the right way suggest the need and sell the paint. But the dealer in building supplies, in many instances, is either too modest, too proud or too lazy to search out a need for anything and then try to fill it.

But about that $3. I spent it to go out and see this farmer. I know it wasn't my place to spend it. If this manufacturer had had a sales manager who trained and sent out real salesmen this salesman would have spent the $3. He would have hired the rig and taken the dealer with him and sold not only the farmer who insisted upon buying, but at least three out of the other six whom I recognized as being prospects. Then he would have taken an order five times as big and left behind a dealer who would go out and get more orders.

But the traveling man didn't do this, and as Fate had decreed that this liveryman was to take in $3 that day it seemed to be up to me. I hope this explanation will prove satisfactory, as I had such a nice time that afternoon I would hate to think of anybody being sore about the $3.

E. E. B.

Exhibits of Building Materials by Lumbermen

The retail lumbermen move slowly but steadily in their business advancement. One of the newest ideas among the more progressive lumbermen is to have a room, or a part of some room, set apart for a display of different building materials, so that prospective purchasers may see and choose that which best suits their needs and fancies. Accompanying this exhibit should be a table large enough to hold books of plans and portfolios of designs, showing perspectives and details of homes and other buildings. Notable among the publications of the past year are those of the National Lumber Manufacturers' Association of Chicago, Ill. From an artistic point of view the BUILDING AGE series of various constructions, issued as a portfolio of building designs and which were selected from illustrations taken from BUILDING AGE excells. No lumberman of worth should be without it. The designs and printing are of the highest type.

Another publication issued by the Curtis people in the way of a catalogue No. 300 is new in that it classifies its work. There is a department for doors, one for windows, one for cabinet work, one for colonnades, interior finish, cabinet work, stairways, verandas, garages, etc., and in short is such a book that a retailer can pick up and show the customer any line with appropriate and beautiful pictures of each, and thus aid the purchaser very much in making a selection for interior work of any kind now produced by a sash and door house. The work must be seen to be appreciated.

The department, or a room added, to which we referred in the beginning, is a great aid to the retailer, besides showing the customer that the dealer is up to date and can give the information and furnish anything which is desired.

C. E. DAVIDSON.

What is designated as "Model Labor Colony" is being started on Staten Island by the Weymar Lumber Company in connection with the new $2,500,000 garbage disposal plant that is being placed in operation. The colony is designed to house the working classes of this plant and other large industrial establishments in the vicinity. Work will be commenced at once on the construction of a number of cottages of five rooms each, equipped with running water, electric light, bath and toilet facilities, steam heat, etc. There will also be erected a large dormitory to accommodate single men and a restaurant for feeding the entire community.

Relations Existing Between the Dealer and the Building Contractor

Conditions Not at All Satisfactory—Some Remedies Suggested by One in the Trade

By "The Old Retailer"

I DON'T believe it is too much to say that the relations between the retail building material dealers and the contractor large and small, are in a chronic state of dissatisfaction. This is not meant simply in a spirit of criticism of the contractors or the dealers either, but a statement of prevailing conditions that have always existed and probably will continue until the relations are changed through putting them on a better business basis.

Contracting a Business by Itself

Contracting is a business by itself and those engaged in it are just like other men who are competing for trade. As with other lines of business, that of contracting is afflicted with many incompetent men who are deficient in knowing the true principles of business. This class is perhaps more detrimental to the contracting business than any other element in it. The honest and capable contractor is often troubled with the competition of day workmen, who, when trade is slack will contract for small jobs at such low prices that he cannot afford to take them.

The Dishonest Contractor a Factor

Again he has the dishonest contractor to contend with, the man who competes with him on a job and underbids him with the intention of using lower grades of materials and otherwise slighting the job in order to make a profit. In the smaller places, a contractor of this class is liable to become more generally known in his methods than in the larger cities where he can operate for many years before his character becomes known to the extent of putting him out of business.

The Architect

There is the architect too, who is not above joining in with the dishonest contractor to beat the owner. This sort of thing is done at the expense of the honest architect and contractor and there is no particular remedy for it in the large cities because the knowledge of such things is confined to a limited circle. Usually the owner does not know he is being cheated, and is not made aware of it until the building itself shows the deficient character of the materials and work. By that time it has been paid for, and he has no practical redress from the contractor. The reputable architects ought to weed out this class from among their number and arrange it so they could not get a license for their occupation, for if all architects were honest, and fair with the owners who employ them, the dishonest contractor would have a hard time getting a job.

What the Dealer Should Do

This suggests also that if the dealers in building materials would exercise more restraint on their desires for getting business through price competition, have a better understanding among themselves with the view of refusing to do business with the dishonest contractor. This individual would either have to reform his methods or seek some other locality to work in. That this can be done, the writer can testify from his own personal experience as a dealer, and not in a small town either. Dealers complain a good deal of the trouble they have with contractors, much of this, however, could be avoided if they would curb their own desires to take chances on a man whom they know is inclined to be tricky, and therefore, risky to deal with. Many dealers have the idea they are smart enough to protect themselves in dealing with a "shady" contractor. They may do this for sometime but in the end he is pretty sure to get the better of them in some way or other, and his being financially irresponsible leaves them "holding the sack" and without chance of recovery. It is not so much on the larger bills they will suffer this loss, because they can protect themselves by taking advantage of the lien law, but it's on the small amounts of material that goes out from time to time without their knowing much about where they go, and therefore, they have no lien to cover them.

Avoid Giving Credit

The writer has found out by many years of experience in both small town and city, that the best way is to avoid having credit dealings with a contractor one cannot fully trust. It is best too, not to run after his cash trade either for if he pays you cash for some sales, he will naturally expect some credit favors on others, and few dealers have backbone enough to refuse them and hence the source of a good deal of their trouble with such men.

This will apply also to others besides contractors. The average business man is prone to forget that his goods are money, and because of this, he will frequently sell to a party on credit, but he would not for one moment think of taking the same amount of cash from the drawer, and loaning it to him on the same terms of personal security and probably the same party also would not think of asking for the money loan.

Contractors Who Worry the Dealers

There is another class of contractors who, though well meaning and honest in their intentions to pay their obligations, yet are a source of worry to dealers. These are the men who are incompetent and lack the business ability to make a success of contracting. They may be excellent workmen and know how to do a good job and their proper place is working for some good contractor at days' wages, but unfortunately for themselves and the material men they are obscessed with the idea and belief that they can take contracts and make more money than working by the day. If they happen to be successful in a few small contracts and make a few dollars on them more than days' wages, it encourages them to make an effort to secure contracts of the larger size.

Estimates are Based on Small Jobs

In their estimating they are governed by how they figured on the small jobs. They do not take into account the larger percentage of margin necessary on the large jobs in order to cover items of unforeseen expense which are contingent to all jobs of this class. To secure the contract they put in a low bid which they have arrived at through figuring on what items they can and guessing at the cost of others they don't fully understand. In fact, the estimating of this kind of a contractor is more of a guessing character than it is of intelligent figuring. As a consequence, it frequently occurs that one or more important items are left out, and by the time the job is completed there is not enough money left in the contract price to pay all the bills of material furnished.

When Labor Is Paid

The labor, of course has had to be paid as the work progressed, including the living expenses of the contractor, and what is left is distributed around among the material men, and the one who goes after it first and pushes the hardest is the most likely to get his account paid in full, but someone has to carry him, and because he is known as an honest hardworking man and shows a disposition to pay his bills, his creditors are generally inclined to refrain from resorting to extreme measures.

The dealers he trades with the most always entertain the hope that he will eventually make enough on some job to square up with them and so they keep on taking chances on him because of his honest intentions which are admirable of course and well enough as far as they go, but their security to pay bills is not of a class as will warrant a business man to rely on it too much for meeting his own financial obligations.

Contractor Should Know How to Figure Accurately

A contractor should not only have honest intentions but along with this disposition should also be the ability to figure and take a job at such figures as will give him a margin that will enable him to carry out his intentions to pay all his bills contracted for that job. This is the kind of a contractor that all retailers in building materials are looking for and wanting to "hook up" with, for many a dealer has realized that in dealing with the honest but incompetent contractor and the contractor who he knows to be tricky there is very little difference insofar as the results are to him.

There have been many cases where the losses have been greater on the well-meaning man than on the one inclined to be crooked for the reason that the one was more closely watched than the other.

Attitude of Dealer Toward Contractor

This leads to the suggestion that both of these classes of contractors should be cautiously dealt with, and each watched equally with the other. What is meant by this is: The dealer should seek to know something more than he generally does about the relative figures at which the contracts are let in which he has an interest for, as before said, it is frequently the case that incompetent contractors take jobs at figures so far below the bids of contractors that are competent that there is small chance of their coming out even on them. If a job of this kind is taken by a good fellow, but incompetent, the dealer who sells him the material should have known the low character of the bid *before he contracted to furnish it.* Frequently, dealers do find this out but too late to save themselves from much worry and possible loss, and so we say, when dealing with a contractor who is not capable of figuring on jobs so as to give him margin enough to pay all his bills. It is best to know beforehand how his bid compares with those we know are capable as then we can judge better of our chances of getting our money for the bill of material we may sell. If it is sold with this knowledge you will then go into the deal with your eyes open. It is astonishing how some dealers will take chances of this kind on selling a bill of hundreds of dollars in value to contractors whose ability to get jobs is known to be based on little else than putting in a bid far below anyone else who is competent and knows his business.

Care Should Be Exercised in Selling

This disposition to sell without due regard as to whether there is money enough in the contract to pay for all the material, is mainly responsible for the continuance in business of this class of contractors. If one dealer won't sell them, another will, is their principal reason for doing it. But, in following this course, they are not only perpetuating a source of trouble to the building material busi-

ness but they are also doing an injustice to the capable and responsible contractor, who, in order to protect his interest, is forced in many cases by this kind of competition to compel the retail dealers in turn to sell him his materials at unremunerative prices, so that, in reality, the effects of bolstering up the incapable contractor are eventually felt by them in the reduction of their legitimate profits.

Contractor Should Buy Direct

But this is not all. The responsible contractor, finding himself in a position where he has to compete for a contract against a lot of irresponsible competition, very often seeks to purchase his material direct from the manufacturer and thus save for himself the profits of the retailer, of whom he is more independent than is the other class of contractors because he is more responsible, and although the ethics of the trade is against selling to contractors, still as we all know, the responsible contractor finds little difficulty in obtaining all the material he requires at wholesale prices.

We do not claim that this is the sole reason why he buys his material in this way. Some contractors will do this anyhow whatever the character of their competition, but the majority would prefer to deal with the retailer because of the better service rendered, if so be the dealers would differentiate more between them and the other class of contractors. Where the responsible contractor has reason to believe that the retailer he is dealing with makes no difference in prices to him and the contractor who is loose in his estimates of the cost of a job, he knows very well his chances for getting a contract are reduced to a minimum if it is left to the lowest bidder.

Awarding the Contracts

The term "lowest responsible bidder" is supposed to govern in the letting of a contract and so it usually does in the case of the larger-sized jobs. But, unfortunately for the really responsible contractor, it is generally taken for granted by the average person letting a contract that every contractor who submits a bid is capable of carrying out the terms of the contract, and the element of responsibility is ignored.

There are few things of which the general public is more ignorant than the subject of building and the knowledge of it is only obtained through having one or more experiences of it. Every man who builds a house for himself knows he can build another that will suit him better, so it is with his experience with the contractor.

The trouble is, the average man is inclined to consider more the lowest bid for the contract than he is the responsibility of the party making the bid, and not until he is notified of a prospective lien to secure the payment of unpaid bills for labor or material, does he wake up to the fact that the responsibility of the contractor is an essential part of the contract so far as he is concerned.

There has been some movement made by the dealers in building materials to obtain legislation for compelling all principal contractors to give a bond for guaranteeing the payment of all claims for labor and materials furnished on a contract, but so far the opposition to this has been too strong for enacting the proposition into a law on the statute books. In some states, however, it has gone so far as to require such a bond for all kinds of public construction work and penalizes the contractor who diverts any money in such contracts to any other purpose, with the enactment of such a law in all the states and applying to both public and private construction work.

It would go far to eliminate the irresponsible and dishonest contractor, and in doing this, it would work as beneficial to both the material men and the responsible contractor. Moreover, it would also be a security to the owner against any "comebacks" in the form of unpaid claims against his property, and thus the security would benefit the whole building business.

Outing of Ohio Retail Lumber Dealers

An important gathering of lumber dealers from Ohio and Michigan characterized the annual summer "outing" of the Ohio Association of Retail Lumber Dealers and the Union Association of Lumber and Sash and Door Salesmen, together with the Michigan Retail Lumber Dealers' Association held at Cedar Point, Ohio, on Friday and Saturday, Aug. 3 and 4. The register of attendance comprised 287 names representing dealers and their families. On account of the warm weather many families made this their summer trip availing themselves of the opportunities for bathing in the lake.

So successful was the "outing" that the Michigan dealers were invited to join the Ohio retailers again at the winter convention to be held at Toledo in January, 1918. A committee was appointed to arrange for this meeting and also to consider the affiliation of the dealers in Ohio, Michigan, Illinois, Indiana and Wisconsin. A strong movement for this uniting of dealers of the five states in a central organization, representing the Middle West, was started during the outing.

The chief social feature of the "outing" was the dinner given on Friday evening at which President William Ryan of the Ohio Association presided. An address was given by Walter Whitaker of Columbus, in which co-operation between wholesalers and retailers for the purpose of elevating the standard of dealing was strongly urged. Other speakers were L. R. Putman of New Orleans, representing the Southern Pine Association; H. R. Isherwood, representing the retailers of the National Lumber Dealers' Association; A. G. Flourney, Virginia, Michigan; Howard M. Rowe, president of the Union Association of Salesmen, and Lawrence W. Smith of Grand Rapids, representing the Michigan association. Following the dinner, there was dancing and a cabaret performance adding jollity to the occasion.



Some Advantages to the Lumber Dealer in Using Motor Trucks in His Business

Making the Truck Pay Its Own Way—What One Enterprising Retail Lumber Dealer in the Central West Has Accomplished

SINCE the economy of motor truck delivery over other methods is figured largely upon the increased mileage covered in a given time, any plan which will improve the working possibilities of trucks will promote economy accordingly. Perhaps the greatest drawback in securing the highest degree of efficiency from motor truck haulage is the time waste during loading and unloading. For this reason, many owners of machines use them only for long hauls, and utilize horse-drawn vehicles for shorter distances, because a motor truck pays its way only when it is traveling.

One subscriber to the BUILDING AGE—the Hawkeye Lumber & Coal Co. of Cedar Rapids, Iowa—has been at work on this problem for some time, with striking results: John W. Barry, president of the company, says:



Fig. 1—Lumber Piled on the Trestles or "Quick Loaders" Ready for Transferring to the Motor Truck

"With hay at $26 a ton and corn at $2.10, oats at 74 cents, here in the heart of Iowa where these things are produced, the question of economical haulage is a vital one. We have specialized in this line; in fact, had to, to reduce expense."

The Hawkeye Lumber & Coal Co. operate Jeffery Quad trucks, and to meet their own requirements they perfected a quick-loader which has more than doubled the working capacity of their machines. This equipment created so much interest and inquiry that Mr. Barry's sons eventually gave their time over to manufacturing and developing a market for it.



Fig. 2—One End of the Lumber Pile Resting on the Truck and the First of the Trestles Collapsed on the Ground

Their system is simplicity itself. The apparatus consists of two movable forms of a height to meet the body of the machine, which serve as trestles for the piling of the load. The truck is backed to meet one end of the load, which drops upon a roller fitted to the end of the truck. The backing continues, knocking the first of the trestles, specially made to collapse, from under the lumber. A loose roller is inserted under the forward end of the pile, and carried with the load to the front of the machine. A pawl at the rear automatically locks the end

roller, a quick chain belt is attached to bind the load that overhangs the rear of the truck, and the operation is complete. In starting forward, the

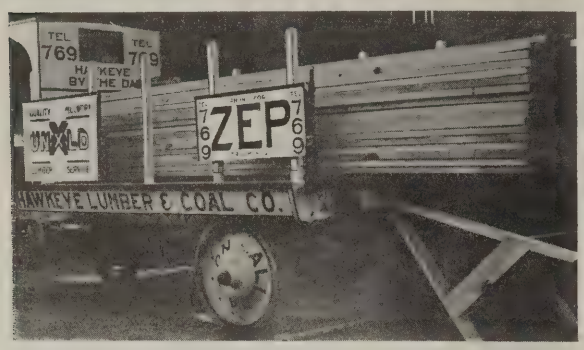


Fig. 3—The Last Stage of the Loading Process

rear trestle of the quick-loader topples forward, easing the full weight without jar to the springs.

Unloading is merely a case of releasing the pawl, and working the lever, which rolls the load back till the force of gravity takes one end to the ground. Then the truck slowly moves forward until the other end of the load is deposited. An idea of the operation of the method may be gained from an inspection of several of the half-tone illustrations presented herewith.

It will be easily understood how this equipment would revolutionize the delivery service of a busy

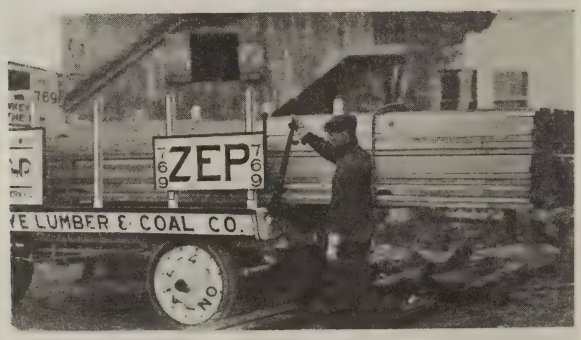


Fig. 4—The First Operation in Unloading the Truck Is Releasing the Pawl to Work the Lever

concern. The principle is applicable to any business where the load can be stacked.

The importance of time-saving of machines and men will be realized when one considers the matter from the standpoint of trucking cost as computed by Secretary of Commerce Redfield, who has stated, in a public address, that the cost of haulage is ten times that of all railroad and lake freights.

This company claims that a three-ton load can be transferred from quick-loader to machine in fifty seconds by one man, and unloaded by the same man in one minute. Mr. Barry gives this report of a record delivery:

"On the 21st of May we had a bill of materials to deliver, and we piled three large loads of material on the trestles, or, as we call them, quick-loaders. The truck delivered these three loads each a mile and a half in an hour and a half, or an average of thirty minutes to the load. Remember this included the time required for putting the load on and taking it off as well as going the distance and returning."

These people are ardent in their commendation of the Jeffery Quad truck. They use two and three-ton machines, and certify that with the proper care this type will travel loaded up hill and down dale on any road. One of the accompanying illustrations shows a Jeffery Quad "doing a turn" under rather trying circumstances.

As will be seen, the rear wheels track perfectly with the front wheels. The Quad is the same gage as standard wagons, enabling it to follow the road. Because of the extreme simplicity of its construction, the axles and transmission girder clear the road sufficiently to greatly facilitate easy handling.



Fig. 5—The Pile of Lumber Sliding Out Upon the Ground

It is capable of making short turns, and gets into and out of hard places easily, with proper handling. These features are all interesting to the firm that must consider country deliveries.

One of the features which the Hawkeye company mark for special attention is economic operation. A duplex governor operates on engine speed in low gears and truck speed in high, automatically supplying just the necessary quantity of gas to the engine at all times, and therefore saving gasoline, while the full engine power is available.

There is little wonder that Mr. Barry and his associates are warmly enthusiastic about the economy of motor truck delivery, when they are able to



Fig. 6—The Truck "Doing a Turn" Under Rather Trying Circumstances

keep their machines working constantly. Whether the destination is distant or nearby makes no difference, so far as economy is concerned, under these conditions.

As Seen by the Man on the Roof

Well Read

Critic—That auburn-haired poetess says that the body is the house of the soul.

Contractor—That's all right; but why the terra-cotta roof?

Pigs in the Clover

"That was a great feat of Subbubs, to catch that burglar in his home."

"Oh, I don't know. Subbubs planned his house himself, and the burglar couldn't find his way out."

No, Indeed

"I understand," said one of the neighbors to our own Mrs. Partington, "that you had a lot of disputes with the contractor who put the lighting into your house."

"Yes," replied that good lady, "but I soon decimated that I wasn't to be insulated by any little electrocutionist!"

Over at the Neighbors'

Citicus—Do your neighbors keep chickens?

Sububs—But not at home.

Taste

"Is it a villa?"

"It is villainous."

Home

A hearth, a rafter,
And love, and laughter,
And heaven after.

Builders of Homes

Up the long hill, from the long toil,
Grime-covered still, scented with soil,
Up from the lathe, up from the loam,
Here come the workers,
Journeying Home.

Up on the crest beacon-lights burn,
Promising rest when they return.
Yellow lamps shine into the gloam—
Lights of the harbor,
Lights of the Home.

You who have made houses for men.
Blessed your trade, more than you ken.
Better than all riches of Rome's,
Better you builded,
Builders of Homes!

All Over Now

"I suppose his patent non-sinkable boat was a valuable secret."

"It was until it leaked."

The Joy of Building

Some Adam of some early time,
Yea, farther back than men believe,
When old gray Earth was in his prime,
A shelter fashioned for his Eve,
And knew the Joy of Building.

Some Adam of some future year,
Yea, farther on than men can dream,
A sill will lay, a rafter rear—
And no new joy will greater seem
Than still the Joy of Building.

The scent of roses, gilt of gold,
The pride of honor, each desire,
Love, laughter—these are gifts of old,
But no heart thrills with holier fire
Than just the Joy of Building.

Everything Else

Housekeep—The grocer didn't put up his screens this year.

Mrs. Housekeep—Well, it was the only thing he overlocked.

One Retailer Who Prospered

"Miss Muchcash says her father made the family fortune as a merchant in Cripple Creek."

"Yes, he was a faro dealer."

Borrowing Trouble

When you want to borrow trouble, do as you do when you want to borrow a little sugar—run over to the neighbors. They probably have much more than you, and would be glad to have you take some off their hands.

The Dream

Neighbor—When do you think of building a home of your own?

Newed—All the time.

Cal, the Carpenter, Says

Some bosses oversee and others overlook.

A door should be hung, but not strangled.

Saving material should stop just short of wasting time.

You may double living, but people will still live double.

Don't say that a job will do until it is the best you do.

Muscle may drive the nail, but it takes brains to start it.

There is a lot of generosity that is like one coat of paint.

The balustrade has the high polish, but the little risers get you there.

It is a fine thing to go home at night feeling that you have made something.

It must be that the man who never learned to cuss never sawed into a nail.

There are two kinds of rich men—those who make money and those who make friends.

There are a lot of people besides carpenters who ought to use the level and square.

When I single a roof on a hot day I try to remember when I piled hay in a mow.

When some men find that they didn't get more than they paid for they holler like they were getting less.

It is dead wrong to look down on another man's trade. Of course it isn't carpentering, but it's a trade.

A man likes to have another man use his saw about as well as he likes to have some other fellow kid his wife.

I'd like to hear a row sometime between a man with a mouthful of nails and a woman with the same of hairpins.

Now that all the men are going to war and all the women to work, the sawhorse will have to get used to a side-saddle.

The mayor says he is going to close up the bad joints. This will be good news to people whose houses were built by bum carpenters.

The mail-order house said it would file my letter kicking about that plane I bought. I'll make the next one so sharp it won't have to file it.

Advice

Why lawyers a regular price
For counseling men should demand,
Why doctors should charge for advice,
Is something I can't understand.
Oh, why is the postoffice filled
With bills for advice if we call,
When a man with a building to build
Can get it for nothing at all?

The fellow next door, and the man
Who built him a bungalow neat,
The guy with a mail-order plan,
Your wife's second cousin upstreet,
They'll pick out your paint and your trim,
New ways to spend money invent;
Some neighbor, just leave it to him—
He never will charge you a cent.

They'll tell you where closets should be,
The registers set in the floor,
And all of their counsel is free;
Why bother with architects more?
And, when you are all settled down
At last in your bungalow new,
It will suit ev'rybody in town—
Excepting, say, possibly you.

Most of the lumber used in the Amoy, China, consular district is grown locally, says Consul C. E. Gauss, writing from that place under date of May 1. Some hardwood is imported from Formosa, Singapore and the Philippines. A small quantity of Oregon pine reaches the port through Hongkong. Soft pine, fir, teak and Philippine, Formosan and Singapore hardwood are in use.

Don'ts for the Retailer

Don't take a discount after the time for taking it has passed. It is a *very* bad form of poaching.

Don't object to a grade unless you are fully satisfied you are justified in doing so.

Don't harbor malice against a neighboring competitor. He must live and besides it pays to keep him in a good humor.

Don't fail to give the traveling man a pleasant greeting; get down to business with him at once. Be frank with him as to whether you are in market. He will like it. That is what he is there for; besides he is an educator in your line. Make him talk, but do not answer questions concerning your business. Make him name prices, and, if he has samples, look at them.

Don't give long credits. No man ever did it and succeeded.

Don't fail to cultivate your banker. Tell him frankly your condition. He will help you.

Don't waste money on advertising which does not give a return.

Don't fail to cultivate a community and a social interest. Get out into the country and get acquainted. The human equation must be considered.

Don't cancel orders because the market goes down, unless the shipment has been unreasonably delayed. Be game.

Don't fail to make your employees understand it is team work. Give them responsibility as they can take it.

Exemption for Building Supplies

In order to facilitate the reconstruction or repair of the buildings destroyed or damaged by the recent earthquake in the city of San Salvador, the president of the republic issued a decree on June 14, 1917, exempting certain building supplies from import duty, as well as from warehouse and other customs charges. No limit is fixed for the period of free admission. The articles affected are as follows: Corrugated and plain galvanized iron and all other kinds of roofing; nails, screws, and washers for attaching roofing; iron nails and wire of all sizes; lumber of all kinds, rough, planed, or grooved; galvanized stamped sheet steel for walls, cornices, brackets, ventilators, and all kinds of architectural ornaments made of galvanized sheet steel or zinc; tar, paints of all kinds, raw and boiled linseed oil, turpentine, and bristle brushes of all kinds; and tents of canvas, drill and duck.

"To use one's credit in business may be a wise and profitable investment, but to live on credit, and thus wear it away, is always dangerous. A man should live on what he earns; and invest his credit only after careful investigation, and when his best judgment convinces him it will be safe, and likely to yield a profit."—*The Wall Street Journal.*

Training for Retail Lumbermen

A course of training for retail lumbermen which has been developed by the Western Retail Lumbermen's Association of Winnipeg, Canada, and is being offered to retail dealers at a tuition cost of $5, has recently received the endorsement of the Retail Lumber Dealers' Association of the State of New York, and is being offered to the members of that organization by Secretary Paul S. Collier of Rochester.

The subjects in the course include elementary drafting under which heading are definitions of geometrical and building terms, the use of drawing instruments, the actual operation of designing the elevation of a small house, methods of getting information from prospective customers to serve as the basis of sketches, the making of free-hand sketches, etc. The actual operation of building is covered in four papers, which embrace the subjects of foundations, concrete work, brick and stone work, mortars, lath and plastering, carpentry, the use of the T-square, elementary consideration of the strength of materials, drainage, sanitation and ventilation, and heating and lighting systems.

Subsequent papers in the course include one on the reading of building plans, three on estimating and a very comprehensive discussion of yard operation, bookkeeping and credits and collection.

The student who undertakes the course receives one paper a week and each paper is, after he has completed it, examined and passed upon by a committee of five retail lumbermen. Examinations are provided for at the close of the course, and certificates will be awarded to dealers who complete the course successfully.

Don'ts for Manufacturers and Jobbers

Don't put too much reading matter in your circulars.

Don't let your vanity as a writer lead you into long winded efforts. Perhaps you really are not so transcendently brilliant.

Don't put circulars and printed matter in with your bills of lading, your invoices. They annoy the recipient. This work is often done by the office girls and a regular customer is bored to death by receiving the same circular time and time again.

Don't ever send anything out with the stereotyped phrase, "Write for prices." If you are not ashamed of your prices, name them.

Don't use the "follow up." Yes, I mean it. At least as usually employed. If you have received a legitimate inquiry, send a salesman, if you can, or write a real letter, not a stereotyped thing that is as devoid of interest as a market page. And send only one. The prospect has some sense, and no doubt understands his business.

Don't, for heaven's sake, if you are a salesman, proceed to cross question your customer as to what brand he carries, what he paid for it, etc. Yes, I know most do it, but not a single first-class salesman ever does it. He ought to know the dealer knows he will make report to his manager and that he would be a fool to divulge news that one wholesale manager would use against another manager, who have their secret agreements, who favored him with a special price, or gave him a carload price on a local shipment. The first-class salesman had a mother who taught him to be a gentleman, and he will be one, present his claims for his goods and ask for an order. Cross questioning has lost many a salesman an order.

Don't take up a busy man's time. Don't do it.

Don't allow the character and integrity of your shipments to be questioned—that is, don't permit the shipping clerk to slip in a few No. 3 boards when the order calls for No. 2. It isn't honest and besides it loses you the next order.

Don't impeach your customer's integrity when he complains of grades, unless you are absolutely sure the negro who perhaps loaded the car is more honest than your customer, who is a white man.

C. E. DAVIDSON.

St. Louis Lumber Trade Exchange Is Organized

The St. Louis Lumber Trade Exchange was organized in St. Louis, Mo., on July 20, with O. A. Pier as manager, to look after the interests of the retail dealers in Southern yellow pine, the organization succeeding the Retail Lumber Dealers' Association of St. Louis and St. Louis County. The officers elected for the ensuing year are:

President..R. E. Gruner of the Philip Gruner & Bro. Lumber Co.
Vice-Pres..J. A. Reheis of the St. Louis Lumber Co.
Treasurer..Louis Esseg of the Louis Esseg Lumber Co.

The above officials with the following constitute the board of directors: Julius Seidel of the Julius Seidel Lumber Co., Joseph O'Neil of the Henry O'Neil Lumber Co. and A. Boeckeler of the A. Boeckeler Lumber Co.

"Rubber" Roofings

In recent years many retail dealers have sold one or more carloads of so-called "rubber" roofings. It is probable that all dealers now understand there is no rubber in such roofings and never was, but the firm which invented or initiated such coverings, named the product "rubber" roofings and the original name stuck. Nine times out of ten when a customer wants an asphalt fabricated roofing he invariably calls for "rubber" roofing and the dealer instantly understands what is desired.

The basis of all such roofings, which are worth putting on a roof, are made up of some fabric, usually claimed as felt, but likely altogether made from rags, which is thoroughly saturated with

asphalt of varying quality. No asphalt, in its native state, is fit for roofing purposes. Much of it has dirt and sand in it. This must be refined out as much as possible, and all asphalt must be mixed with a flux to give it the proper amount of elasticity, pliability, etc.

Dealer Has No Method for Testing Product

The dealer has no specific method of testing the product and must rely very largely upon the reputation of the firm with which he is dealing for quality. However, after several years of handling, he comes to know, rather by his instinctive nature, just whether a certain roofing will give service or not, but if called upon to say precisely and learnedly why, he would be at a loss.

Asphalt Is Found in All Parts of the World

Asphalt is now found in all parts of the world. Originally it was thought there was only one real asphalt, that which is known as the Trinidad asphalt. It is claimed that the product of Trinidad Island, British West Indies, which lies 700 miles north of the equator and about 2000 miles from New York City, is superior to any other, and while it no doubt takes less flux to perfect it as a commercial asphalt than any other, yet real asphalt is no doubt the same, pretty much, the world over. There are no doubt different qualities, just as there are different grades in oils, because asphalt is nothing but the basis, or the refuse, of petroleum. Geologists recognize that fact. Asphalt is now mined in Colorado and in California and in other parts of the United States and the world. In refining oils a certain percentage of asphalt is usually produced and no doubt much of this goes into "rubber" roofings, and, presumably, if not mixed too much with coal tar, makes a good material. I am told that some oils have asphalt as a base and other oil fields have paraffine as a base.

Then, it follows that the quality of the "rubber" roofing depends upon the quantity and quality of the asphalt used, and also the texture of the fabric, or rags, used in its manufacture. No doubt the manufacturer's skill and secret knowledge count as large factors also.

History of Trinidad Asphalt

The history of the Trinidad asphalt is interesting. The "lake" where it is gathered contains about 114 acres and is of unknown depth. It is owned by the British crown, and produces King George a royalty estimated to run over three million dollars per year. Quite a nice little income for the distinguished gentleman. A lease consummated in 1914 of 99 years' duration was effected. So George, beg pardon, King George, has a right smart investment.

Much of the roofings made contain the Trinidad product and many others the American product, which is either mined, as stated, or is bought from oil refining companies.

C. E. DAVIDSON.

Special "Form" for Use of Lumbermen in Loading Cars

A special form recently prepared by the carriers to show whether lumbermen are doing their duty in loading cars has been sent to subscribers of the Southern Pine Association. It is stated that the carriers will look with favor on requests for cars coming from shippers co-operating with them to the extent of keeping this record, which is prepared on a regular form showing outbound loading and detention, for weekly periods. The form calls for information on date of shipment, initials and number of car, destination, commodity, marked capacity of car in pounds, weight of load in pounds, number of pounds loaded less than marked capacity, reasons why car was not loaded to marked capacity, number of hours car was detained for loading from time it was placed for loading, number of hours in free loading time, and reasons why car was not loaded within free time.

The Southern Pine Association is engaged along another line by which it hopes to increase the efficiency of car service, by distributing among subscribers the plan recently evolved by the railroads for bulkheading lumber loaded on open cars, particularly dressed lumber, which has a tendency to shift en route, if not properly staked, necessitating a restaking by the carriers and resulting in serious detention of cars. The association believes that a good part of the lumbermen will adopt the bulkheading system.

Building Materials Required for Army Cantonments

A pretty good idea of the extent to which building materials are required in the construction of the 16 army cantonments may be gained from figures issued by the War Department.

In the Southern States there will be about 5,600,000 board feet of lumber, 7,800,000 board feet of dimension stuff, 177,000 ft. of 4 x 4-in. timbers, 2,800,000 ft. of flooring, 1,200,000 ft. of siding, and 1,400,000 ft. of matched boards. In the northern cantonments the amount of lumber will be increased about 216,000 board feet.

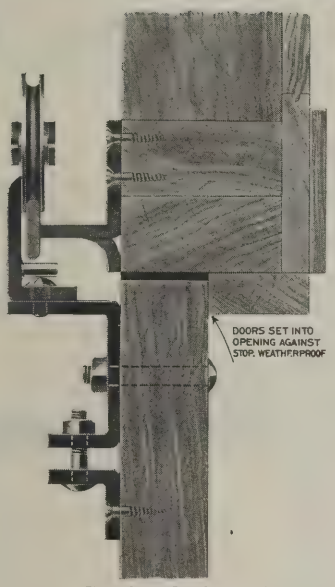
To construct one of these cantonments in the South it will be necessary to use over 2500 kegs of nails, and in the northern cantonments about 2650 kegs. The buildings in a southern cantonment will require 4800 rolls of sheathing paper, 6300 squares of one-ply roofing, 21,900 squares of two-ply roofing, and about 2000 rolls of tarred felt. In the northern cantonments the amount of one-ply roofing will be reduced to about 800 squares, while the amount of tarred felt will be increased to 3200 rolls, on account of the more rigorous climatic conditions.

The concrete work in a cantonment is estimated to require 4700 bbl. of portland cement, 1400 cu. yd. of sand, and 2500 cu. yd. of broken stone or screened gravel.

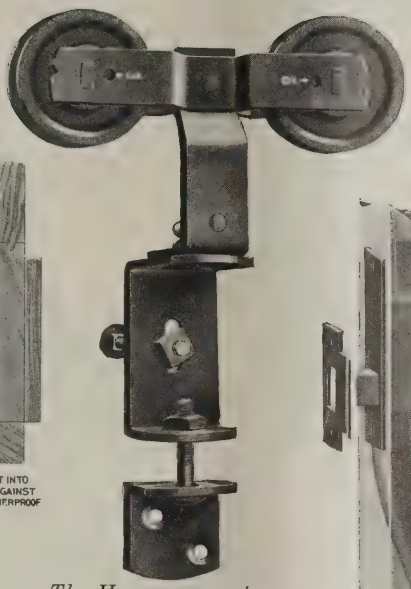
The amount of electrical equipment will vary with the shape of the cantonment.

SOMETHING NEW

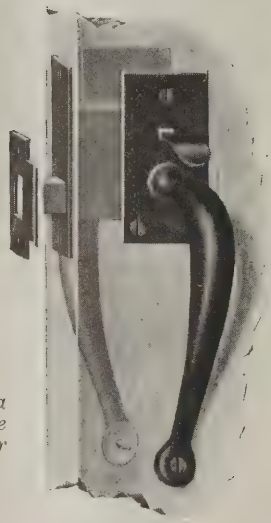
IN GARAGE DOOR SETS



Sectional view of Swivel Hanger



The Hanger operates on a swivel and turns on the track without sticking or binding in any way



The No. 27 Latch has no complicated parts to get out of order

Show the automobile owners in your city the easiest working garage door set ever put on the market.

Show them how with a simple push the doors are opened; a slight pull and they are closed.

Work as freely as any house door.

Equipped with this set, doors swing into jamb against steps, the same as in high class house construction.

National Garage Door Set

Absolutely Weathertight—Snow and Ice-Proof

Free and easy access to garage at all times may be had, because one door is so hung that it will open without disturbing the other two doors.

Adjustable feature prevents sagging of doors.

Doors require but a minimum of space in opening as they are hung on the inside and fold and slide against inner wall.

Every auto owner in your city, and every new car sold means garage hardware business for you. Why not sell them the best?

THE PRICE is within everybody's reach and there is a liberal profit in them for you, Mr. Builder.

Send for illustrated folder and give dealer's name.

National Mfg. Co., Sterling, Ill.



The appearance of garage from outside is enhanced by absence of any structural iron work. Note how the one door opens without disturbing the others



"Ah,—Here's the Real Thing at Last'——

and Low in Price!"

$2.75 per Gal.

Takes the place of Shellac, Varnish and Lacquer for every purpose. Dries in three hours. Hardens overnight.

Degrah TRADE MARK REGISTERED CUTS DOWN YOUR CARRYING COSTS

Pore-filling and Non-penetrating like SHELLAC. Tough, Glossy and Neutral like LACQUER. More Durable and Rubs Quicker than VARNISH. The most remarkable wood finish ever offered regardless of price—the result of 22 years of scientific thought and chemical experimentation. Made of degras (pronounced Degrah), the animal oil taken from sheeps' wool combined with other high-class ingredients. The result is an entirely new and different product. Has longer life and greater elasticity than mineral or vegetable oil products.

Takes the place of Shellac, Lacquer and the following varnishes: Hard Oil Finish, Cabinet Rubbing, Finishing, Floor, Spar, Automobile and Carriage Varnish. Perfectly neutral for Brass or Copper. Makes a Bronze Liquid. Can be used directly over Hardwood Stains. Prevents penetrating stains from bleeding. Equally good for both interior and exterior use. Transparent and smooths out like glass. Two coats do the work of a coat of shellac or filler and three of any varnish selling at the same price.

Apply it one day. Sandpaper it and apply more—or Rub or Polish it—the next morning. Also comes in DEGRAH Enamel Varnish, and DEGRAH White Enamel.

We are publishing this ad for the express purpose of asking every reader of the BUILDING AGE to send us his name and address and receive a free sample. There is no obligation. Write for the FREE sample to-day—NOW.

KEYSTONE VARNISH CO., 2012 Keystona Bld ., Brooklyn, N. Y.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

The "Indestructo" Carpenters' Tool Case

There are many times in the experience of the practical carpenter when it is desirable to carry only a small "kit" of tools to the job upon which he may be engaged and it is cumbersome to handle the tool chest. He as a result is in need of a lighter and handier tool case to convey his "kit" and is therefore likely to be interested in the line of carpenters' cases which are turned

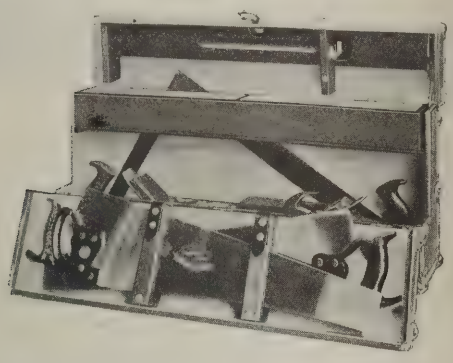


Fig. 1—The "Indestructo" Carpenter's Tool Case Shown Open

out by Wedell & Boers, 157 Jefferson Avenue, Detroit, Mich. These are made in the suitcase style and are neat, light and strong. One size, shown in Fig. 1, is built of three-ply basswood veneer, canvas covered, painted, and waterproof. There is a strong handle on the top, so that the tools are carried as if in a suitcase. It has a special four-tumbler lock and is steel reinforced on all corners and edges. The inside measurements of this case are 32¼ in. long, 7½ in. wide and 14½ in. deep. The case is said to be sufficiently roomy to hold a miter box in connection with the other tools. The saw rack will hold four saws. A smaller size is made in two lengths—one for 26 in. and the other for 28. in. saws. A swing tray for chisels and bit is provided and the case is the right height to hold a 24 x 16 in. square. Still another size is 30¼ in. long, 14½ in. high and 6 in. wide inside, this being intended for a 26 in. saw. The case for 28 in. saws is 32¼ in. long, 14½ in. high and 6 in. wide inside. Those carpenters who wish to make their own case can secure from the manufacturers a full set of trimmings at a very reasonable price.

Specification for Ambler Asbestos Roofing and Siding

Builders all over the country are likely to be interested in the specification for Ambler asbestos corrugated roofing and siding which is being distributed in pamphlet form by the Keasbey & Mattison Company, Ambler, Pa. This specification not only tells how to apply the material in question but also gives a very interesting description of the shape in which it is furnished together with a brief account of its manufacture. The matter is illustrated by means of numerous halftone engravings of buildings in connection with which the material has been used. In conclusion the specification states that in order to insure complete satisfaction in all cases the makers have instituted "a free inspection service which is available to all purchasers of Ambler asbestos corrugated roofing and siding, not only for passing upon material after installation but also for passing upon drawings and making suggestions while designs for buildings are in course of preparation."

"Reliable" Folding Scaffold Brackets

Some time ago the makers of this scaffold bracket used to sell direct to contractors but this year they began to sell through lumber dealers who we understand handle the brackets very successfully. This is a specialty which has not heretofore been sold to any extent among dealers and the trade will undoubtedly be interested in the present policy. It is made in two sizes —36-in. and 48-in. extension, the weight of the former being 18 lb. and of the latter 25 lb. It is known as the "Reliable" and is made by the Elite Manufacturing Company, Ashland, Ohio, who state that if after using them ten days, the purchaser is not absolutely satisfied that they will do what is claimed for them, the brackets can be returned to the dealer from whom they were purchased or direct to the company and the money will be refunded.

New Model of "Universal" Saw

A machine which has been specially designed to meet the requirements of a general line of work, more particularly for ripping, cross cutting and dadoing, is illustrated in Fig. 2. It has a heavy, massive frame, with broad base to give ample support and is constructed to stand up under the hard usage to which it is likely to be subjected in the present-day shop or factory. The two iron tables are each 60 in. long and 24 in. wide and

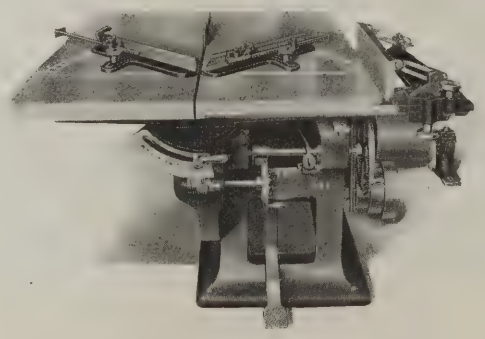


Fig. 2—General View of New Model of "Universal" Saw

have slightly rounded corners on the outside edges. The left hand table is adjustable with screw to and from the saw so as to allow dado heads to be worked. The table also tilts to an angle of 45 deg. by means of a hand wheel in front of the machine. When down to its lowest point the height of the table is 34 in. The machine is equipped with a ripping gage which also tilts to an

angle of 45 deg. The machine is furnished with right and left hand miter gages indexed up to 45 deg. and marked on the table in 5 deg. section. The bar for the rip saw gage is fastened to the table and is indexed by ⅛ in. up to 24 in. The manufacturers call especial attention to the table on this machine, there being no grooves planed in the face of the table for the different gages. The saw mandrel is of steel and where the saws revolve is 1¼ in. diameter. The saw is brought forward to the work by power, a slight pressure of the foot lever in front being all that is necessary. When the cut is completed, the lever is released and the saws return automatically to idle position. An adjustable stop regulates the distance of travel as desired and will cut material any width up to 24 in. The yoke that supports the table is securely gibbed to the frame and is raised and lowered by large diameter raising screws having ball bearings and is operated by a large hand wheel at the side of the machine. This new model of universal saw is made by the Hall & Brown Woodworking Machine Company, 1913 to 1933 North Broadway, St. Louis, Mo. We understand that any reader of the BUILDING AGE who may desire additional particulars in regard to the construction and operation of the saw can obtain them by addressing the company.

Storing Wallboard Stock

It is generally recognized in the trade that the convenience of handling wallboard depends in large degree upon the manner in which it is stored. Those who have not already solved the problem to their entire satisfaction will be able to derive points of suggestive value from an inspection of Fig. 3, which represents a storage rack of Beaver board in one of the yards of the Rittenhouse & Embree Company, Chicago, Ill., and which holds 20,800 ft. of six lengths in 32-in. and

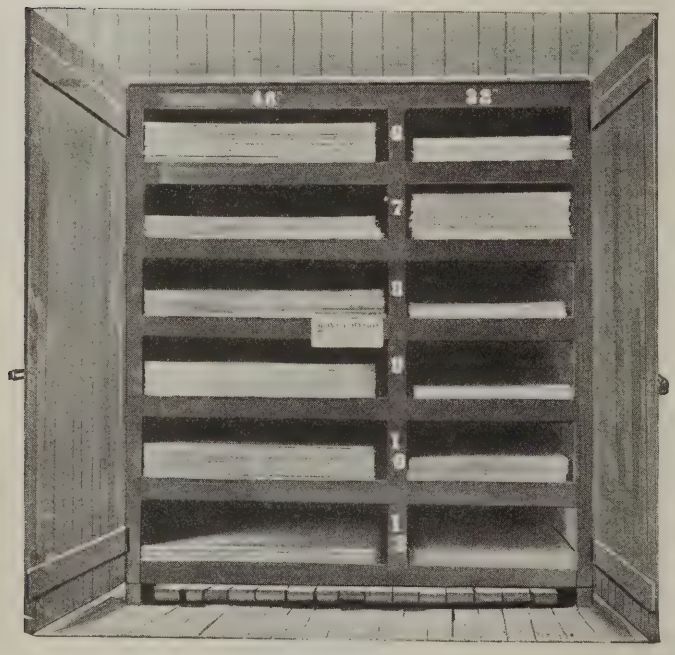


Fig. 3—Rack for Storing Wall Board

48-in. widths. This storage rack stands in the company's dressed lumber shed and occupies a place 7½ ft. wide, 12 ft. deep and 8 ft. high—a small amount of space considering the value of the material, profit and rapid turnover. The doors—shown open in the picture—are an important part of the rack as they make it possible to keep the board clean, although it is unbundled. The rack is substantially built and for the bins 6-in. matched board flooring supported by 2 x 4's was used. The bins are separated by a 4-in. double partition. Two-inch play was allowed for the wallboard and each bin holds sixty panels.

The Richmoor Wage Computor

When a contractor is employing a large number of hands on jobs which he has under way, the compilation of the payroll is something of a factor and anything which will facilitate the work is greatly appreciated. Along this line is the device known as the Richmoor

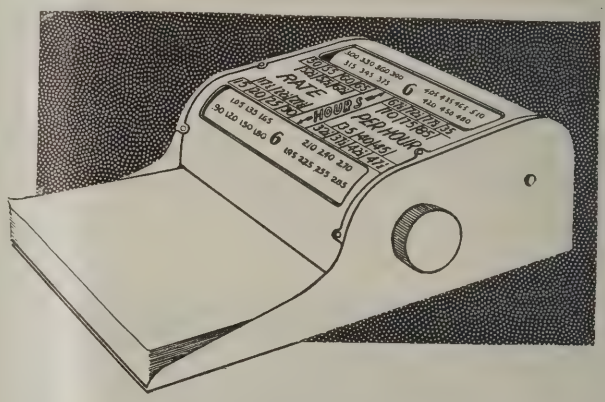


Fig. 4—The Richmoor Wage Computer

wage computor offered by F. D. Bassett Company, 608 South Dearborn Street, Chicago, Ill., and shown in Fig. 4. It is said a clerk can figure the most complicated payroll in short order and without resorting to a single written calculation. The wage total is brought directly under the rate per hour by a simple twist of the controlling lever and everything is right before the eyes of the clerk. The wage rates per hour from 15c. to 85c., which cover practically every need of the building trade, are etched in clean-cut black and red figures on a metal dial. Revolving rolls show the "time" from a quarter hour to 65 hours in bold red figures, at the same time bringing under the desired rate on the dial the amount each man is to be paid. A turn of the lever and the job is done—every man's time figured accurately and as fast as one can write down the totals. The device is of such a type that it can be carried in the pocket if desired and there is no complicated mechanism to make it heavy and cumbersome. A convenient feature of the device is a memorandum pad which puts records of appointment, important duties and office details where they cannot be overlooked and mislaid. Contractors who have made use of the wage computor speak in high terms of its value and usefulness for the purpose.

Colonial Fireplace Designs

Of interest to architects and builders is the catalog entitled "Fireplace Designs" now being distributed by the Colonial Fireplace Company, Chicago, Ill. In it are described the two methods of selling fireplaces followed by the company, one being called "The Colonial Way," and is made up to order just as desired. This method details the fireplace full size on paper to meet conditions, and the material is selected and laid out to fit the detail. Specially drawn plans are provided covering the customer's particular conditions, these plans being drawn to a scale and showing how the rough brick should be constructed to properly receive the fireplace from the ground up to the ceiling above the fireplace, covering the important points step by step. The second method followed by the company, termed "The Usual Way," does not include the service and extra

(Continued on page 22 of the advertising section)





Now I'm Reroofing My Town

My first NEPONSET roof was the envy of the neighborhood. It added tone to the building. Many thought it slate. They asked me about it. Found out it was spark-proof, a wonder in wear and economical in laying. They saw samples in soft green and red colors.

NEPONSET
TWIN
SHINGLES

Asphalt, Slate-Surfaced, Fire-Resisting

(Patent Applied for)

Large national advertising kept the subject in their minds. Page advertisements explained the beauty, wear, safety, and saving in Neponset.

Orders came in fast. They have kept on coming, for every Neponset roof has given real satisfaction. Those Neponset Twin Shingles are impregnated with everlasting asphalt and coated with crushed slate jammed right into the fibre.

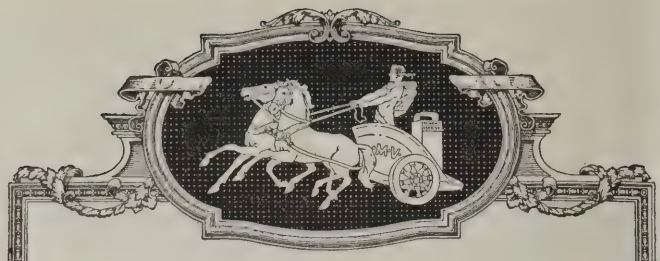
BIRD NEPONSET PRODUCTS

Look for this trademark on all Shingles, Roll Roofings, Wall Boards and Building Papers. There is one meeting every requirement and purse—all guaranteed by us.

Send for full information on Neponset Building Products and the free booklet, "Repairing and Building"

BIRD & SON (*Est. 1795*) **Dept. C, East Walpole, Mass.**

New York Chicago Washington Canadian Office and Plant: Hamilton, Ontario



Your faithful ally

When you finish a job with Murphy Varnish or Murphy White Enamel, you feel safe. You know you've left a strong and trusty friend on guard who will protect your work from injury and keep it looking like new.

Murphy Varnish

"the varnish that lasts longest"

is not a luxury. Compared with ordinary varnishes the Murphy house-finishing products cover so much more area that they cost less to use than finishes that have less staying qualities.

May we send you further information about

Murphy Transparent Interior
Murphy Transparent Floor
Murphy Transparent Spar
Murphy Nogloss Interior
Murphy Semi-gloss Interior
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A

(Continued from page 534 of the Editorial Section)

articles furnished with "The Colonial Way," but includes only a blue print working plan drawn to scale showing how the fireplace should be built of brick, etc. One of the important parts furnished in connection with the fireplaces is the improved Colonial Head, so constructed that provision is made for expansion and contraction. The catalog contains full information regarding these various points and contains numerous examples of fireplaces which the company is prepared to furnish, many of these designs being illustrated in colors. Sizes and prices of each are also given. The catalog is accompanied by blue print details showing various features of construction of the fireplaces made by the company.

The "Acme-Scriber" Carpenter's Tool

A tool which every practical carpenter finds a useful adjunct to his "kit" is a scriber, and in this connection the trade will be interested in learning that the Hollander Manufacturing Company, 2618 East Fifty-third Street, Cleveland, Ohio, has recently purchased the entire business of the "Acme-Scriber" carpenter's tool,

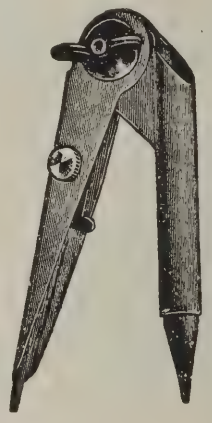


Fig. 5—The "Acme-Scriber" Carpenter's Tool

which the concern is now marketing at a price within the means of every practical mechanic. We understand that the company has added an improvement to the tool which it is claimed will practically double the life of it and hence render it of greater service than heretofore. The company has also nickel-plated the tool thus making it non-corrosive. We present in Fig. 5 a general view of the tool as it appears ready for use.

Jones Sidewall Register

A new presentation of the Jones register is made in catalog No. 17, issued by the United States Register Company, Battle Creek, Mich. This is presented as a practical sidewall register of the baseboard type, designed for use in buildings to avoid cutting the floors and the entrance of dirt from the floor into the register, also to permit of a much larger opening into the box connected with the register than with the old type of valve sidewall registers. It is shown in a variety of styles and sizes adapted to the requirements of modern buildings and is also made as a cold-air face for the return of the air in the building to the warm-air furnace where it is desired to recirculate the air to facilitate heating. Diagrams show different methods of connecting and using the register and the tables give full dimensions and prices. Another section of the catalog is devoted to the National, Michigan and National Convex registers, also of the baseboard type and adapted to the needs of modern trade. There are also shown cast-iron cold-air faces as large as 30x36 in. in

(Continued on page 24)

Gasoline by Air Pressure

The New Way—The Safe Way

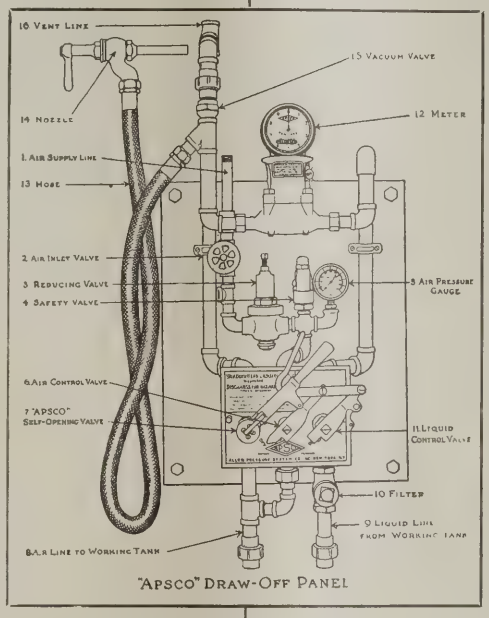
Safety: An important feature of the APSCO System which has gained for it the approval of the National Board of Fire Underwriters is its safety against fire.

This system for storing and distributing gasoline, oil, or any other volatile liquid is so constructed as to eliminate the possibility of ignition or explosion.

Economical: Economy of operation is assured. There is no opportunity for the liquid to vaporize or gases to collect — full strength and quantity of liquid is certain, because it cannot be left running, nor is it exposed to the atmosphere at any point within the system.

Permits: The approval of the National Board of Fire Underwriters means not only safety in operation, but assures lowest possible fire insurance rates, at the same time tending to obtain the co-operation of local authorities in the matter of permits and approvals.

Tested: The APSCO System is not an experiment — it is a demonstrated success, in actual operation in many garages and mercantile establishments, where it is daily giving marked satisfaction.



"APSCO" DRAW-OFF PANEL

Accurate: The Special APSCO meter tells at a glance the amount of liquid drawn off—a meter tested and sealed by the Bureau of Weights and Measures of the City of New York.

Speedy: Speed of delivery is at times a vital factor, and the APSCO System meets all requirements in this regard.

No Labor: To operate the APSCO System you simply pull a lever. No labor is required; a small amount of air pressure does the work. There are no complicated cranks or other laborious devices to bother you.

Lift: Delivery on the third, fourth, fifth, sixth or any other floor is just as easy for the APSCO System as on the ground floor. The system is quickly and easily adapted to varying conditions of height, distance or speed of delivery without in any way affecting the accuracy or safety of the system.

Service: In a word, the APSCO System is economical, safe, speedy and accurate. The multi-storied garage, or the smallest, needs this truly efficient labor-saving, time-saving, money-saving system. Our staff of experienced engineers is ready at all times to co-operate to the fullest extent.

Write for Literature—Agencies Wanted

The Allen Pressure System Co., Inc.

16-24 West 61st Street **New York**

ALWAYS LOOK FOR THE GREEN PANEL

PROTECTION FOR BUYER AND SELLER



Builders know

that even the moderate priced home needs more than one bathroom. The guest room, with its private bath, has become almost a necessity.

Then there should be an extra bathroom for the children. Because of its beauty and hygienic construction, builders are choosing

KOHLER WARE

always of one quality—the highest

Our manufacturing economies enable us to make KOHLER WARE available for homes of all classes, from the modest cottage up.

KOHLER WARE is first choice for the finest residences, apartments and hotels. All modern patterns.

"It's in the Kohler Enamel"

The "Viceroy," our special *one-piece* built-in bath, is the most popular tub of its type ever constructed. Be sure to see it.

Every KOHLER product has our permanent trade-mark in the enamel. It is a guarantee of first quality.

Write for free copy of our interesting book, "KOHLER OF KOHLER." It contains much useful information for builders.

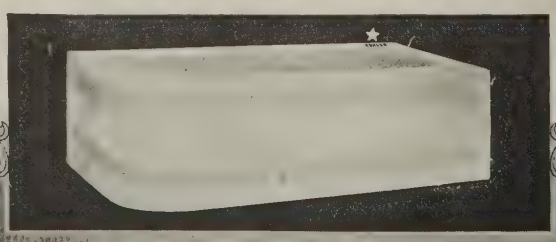
KOHLER CO., *Founded 1873* **Kohler, Wis.**

Boston, New York, Philadelphia, Pittsburgh, Detroit, Chicago, Indianapolis, St. Paul, St. Louis, Houston, San Francisco, Los Angeles, Seattle, London

* The star indicates the location of the KOHLER permanent trade-mark in faint blue.

"Viceroy" F-12.

(Patent applied for and name reg. U. S. Patent Office.)



size, having an unobstructed area from 157 to 564 sq. in. Both wrought steel registers with wrought steel borders and cast-iron registers with cast-iron borders are shown, with various types of ventilating registers and devices for opening and closing them. The U. S. wooden cold-air faces for use in connection with furnace work are shown, then a line of register boxes, furnace pipe and fittings. Handy furnace pipe and fittings, round pipe and elbows, galvanized iron cold air ducts and the flues for connecting them with the casings of furnaces and a variety of grilles for use in warm-air heating systems.

Kenny Concrete Blocks

An interesting method of reinforced concrete circular block construction for use in silos, etc., is illustrated and described in the literature which is being distributed by the Kenny-Hoflund Company, Harwarden, Iowa. The blocks are grooved on top, and in the groove is placed a high carbon steel rod encircling the entire silo and with the ends overlapping the key block, over which they are bent. The cored out ends form an opening two inches in diameter where the blocks are laid together, and these openings are filled with cement mortar. The interior of the silo is given a coat of plaster made of rich concrete, and the walls are finished with a brush coat of pure cement. The blocks weigh 53 lbs. each, and are 4x8x24 in. in dimensions. The machine used makes two blocks at once, and is provided with various conveniences calculated to add to the ease with which it may be handled, and thus increase the output. It is stated that one machine can turn out in one day a sufficient number of blocks to construct one silo.

National Garage Door Sets

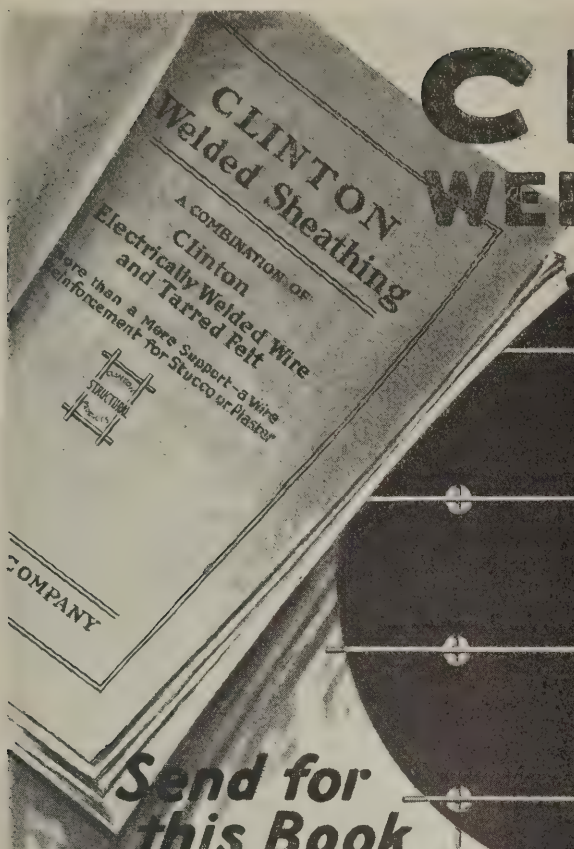
"Some Things New in Garage Door Sets" is the title of an illustrated folder which is being sent out by the National Manufacturing Company, Sterling, Ill. This folder makes announcement of the "New National Easy Working, Sliding and Swinging Combination Garage Door Sets" made by the concern in question. It is pointed out that there is absolutely no binding or friction and that garage doors hung with this set will work as freely and easily as any house door. The doors are adjustable in case of swelling or raising of the cement floor and the adjustable feature prevents their sagging. The doors are referred to as weather-tight and that snow and ice cannot in any way interfere with opening and closing of doors hung with this new set. Illustrations are given showing the details of the set and also general views clearly indicating the appearance of the doors when open and also when closed.

Inlaid Slate

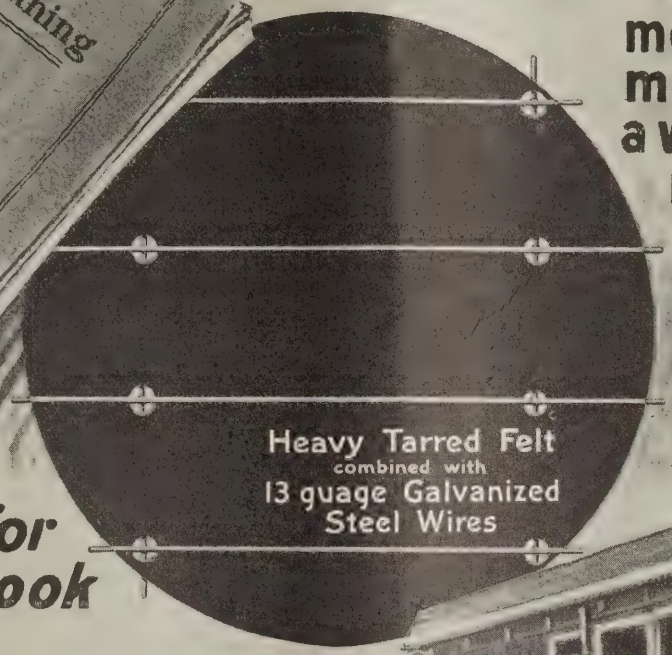
Inlaid slate is a small tile roofing made by a patented process and applied over a built-up waterproofing with a special high-melting asphalt. The slates measure 3 x 6 in. in dimension and are split thicker than the ordinary roofing slate. The small size together with the extra thickness is said to double their strength, and the 3-in. width allows it to conform to uneven surfaces of a roof deck, such as gutters, rounded hips or valleys, without the necessity of cutting the slate. As the cost of laying so many small slates on the roof would be rather high, this cost is reduced to one-fifth by making every five slates into a unit at the quarry. This is done by having a backing of roofing felt bonded to the slate with a high-melting asphalt mingled with sand under heat and pressure. Inlaid slate is said to be perfectly safe to walk upon. A folder illustrating and describing this product

(*Continued on page 26*)

CLINTON
WELDED SHEATHING



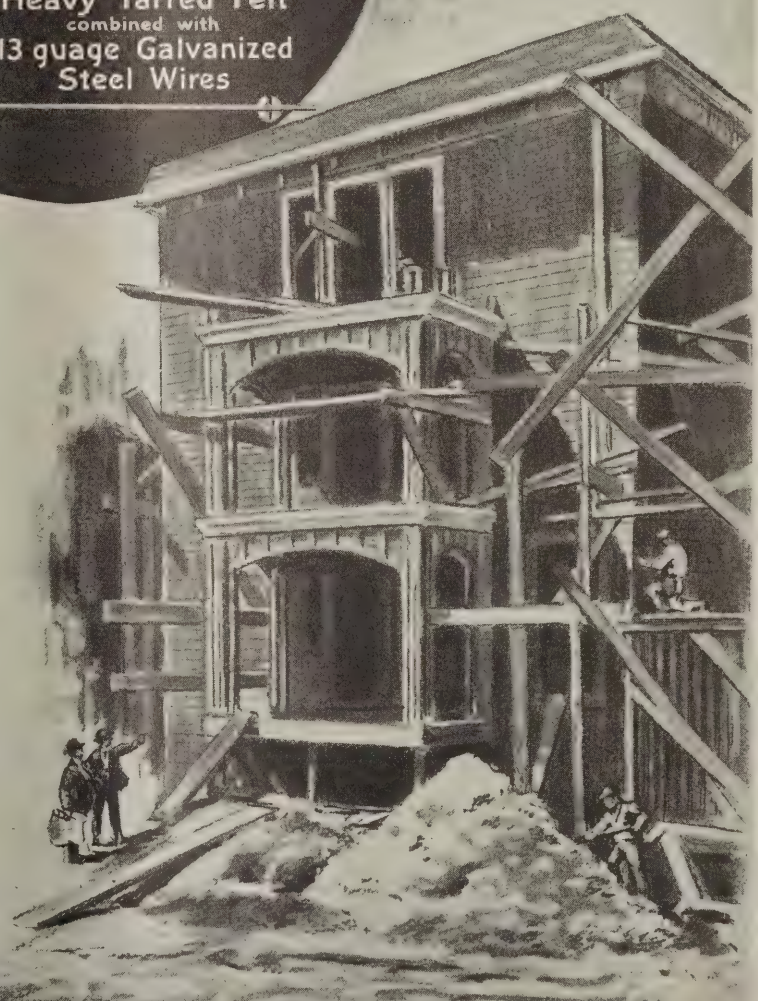
more than a mere support a wire reinforcement for Stucco or plaster. —



Send for this Book

If you are interested in the application of plaster and stucco in the most economical and durable manner, let us send you our book telling about this wonderful lathing material, the speed with which the plaster can be applied, the firm backing it affords, the saving of mortar on the scratch coat, and above all its superiority over types of metal lath.

Our book proves all that we claim by tests and facts, and we want you to have a copy.



CLINTON WIRE CLOTH CO.

CLINTON, MASS.

BOSTON NEW YORK CHICAGO

FIRST WEAVERS OF WIRE BY POWER IN THE WORLD

Fiberlic

Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895

TRADE MARK

TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.
Owned and Operated by Nicholson File Company

is being circulated by the Inlaid Slate Co., Pen Argyl, Pa. Illustrations of numerous prominent buildings upon which this product has been used are contained together with a caption pointing out interesting points in connection therewith. One illustration shows the method of laying Inlaid Slate units.

New Type of Garbage Burner

In these days when so much attention is being given to sanitary conditions and appliances which assist in promoting them, special interest attaches to a new type of garbage and waste consumer which has just been brought out by the Buffalo Co-operative Stove Company, Buffalo, N. Y., and an illustration of which is presented herewith. The device is known as the "Isolator," and is said to solve the problem of sanitary, economical and convenient waste disposal at the source of its origin. It is constructed of a high grade of

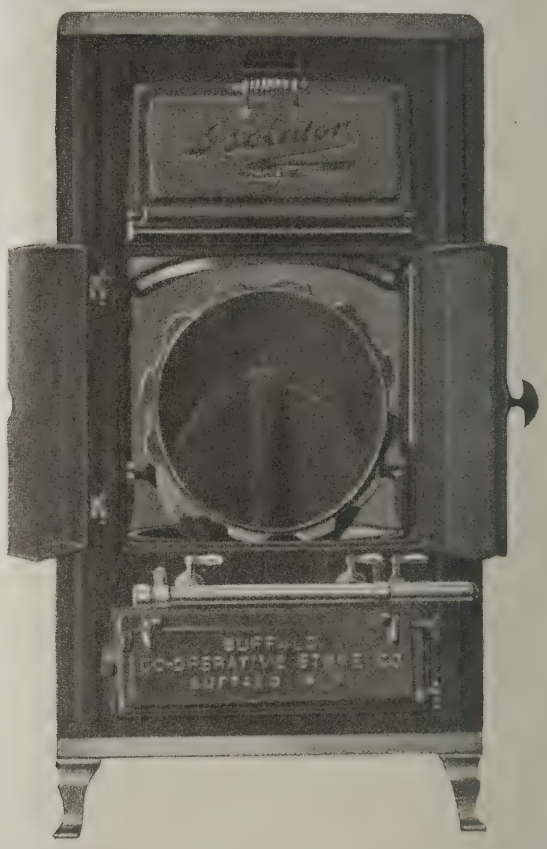


Fig. 6—New Type of Garbage Burner with Front Doors Open, Showing the Container in a Tilted Position

gray cast iron, and is therefore very durable. It is insulated with asbestos and in addition it is constantly cooled by means of a scientific cooler arrangement that conducts the warmed air into the chimney flue and permits the fresh, cool air to enter. A sheet-iron casing surrounds the apparatus. All parts are interchangeable, and can be replaced at any time with no other tool than a screwdriver. There are no grates to get out of order and the burners are of such a nature that it is said they cannot become clogged with ashes or dust. In Fig. 6 of the illustrations we show a front view of the Isolator with the refuse container slightly tilted forward, the front doors being shown wide open. The apparatus has a capacity of one bushel and occupies a floor space 24½ in. square. It is to be noted that in operation the refuse is deposited in the apparatus through a hopper located at the top and in operation it is only necessary to set a dial and light the gas. An automatic attachment shuts off the gas at any time

(*Continued on page 28*)

For Every Bench Use There's a Sargent Automatic Set Plane

And every user feels it's a different plane by the way it takes hold of *any* wood.

Here's why: Thin cutter with quicker grinding advantage, Rigidity for sure work, Quick and Easy Adjustment for coarse or fine cuts, Adjustable Knob, and Automatic Set, by which the clamp, when replaced after removal, will always return to its original position until reset.

Ask your dealer to show you the Planes that do work not possible with other planes, or send for catalogue describing these and other Sargent Planes.

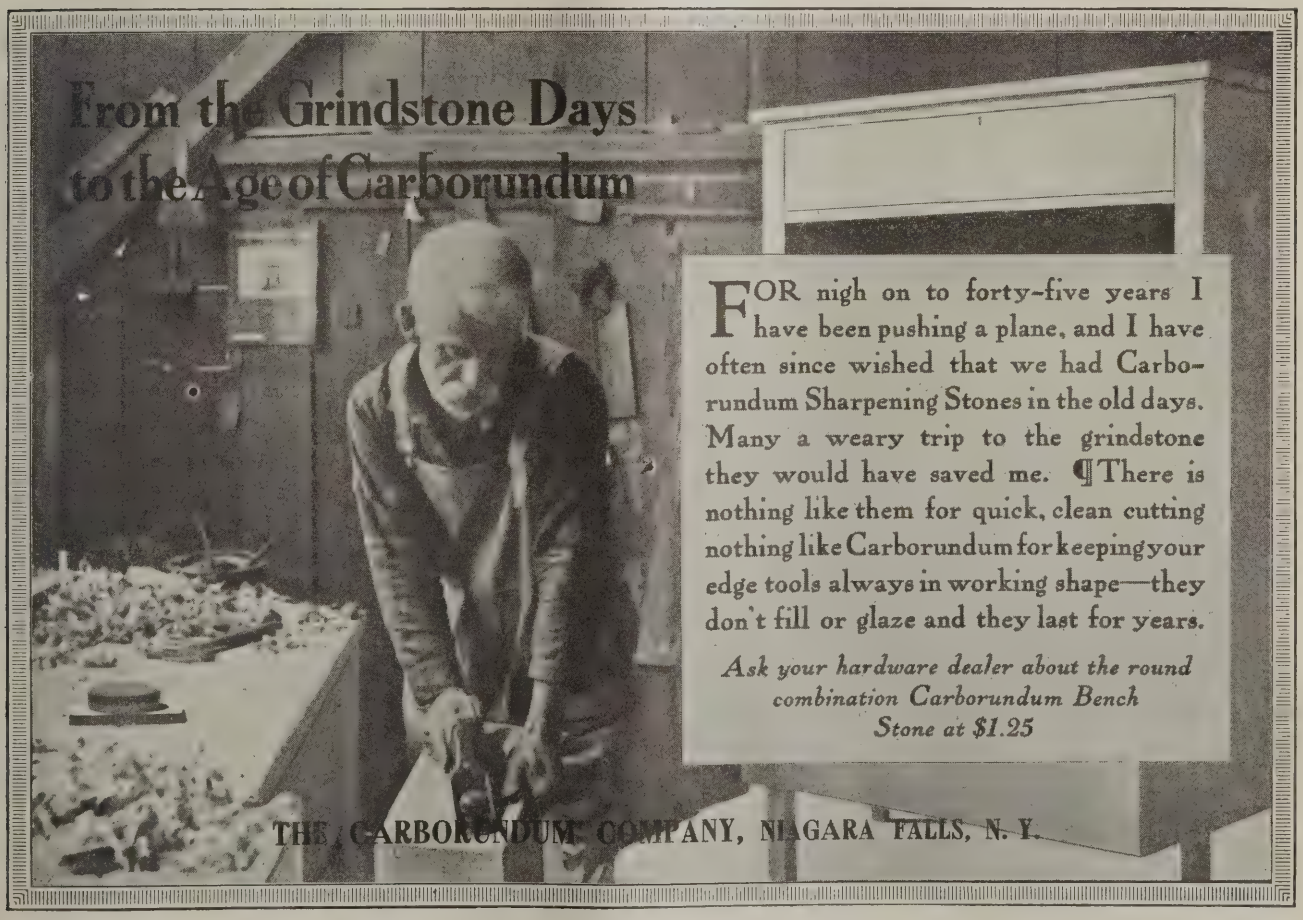


SARGENT & COMPANY
53 Water St., New Haven, Conn.

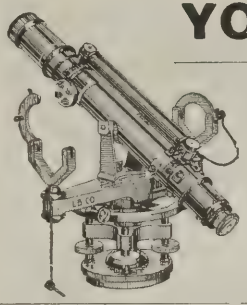


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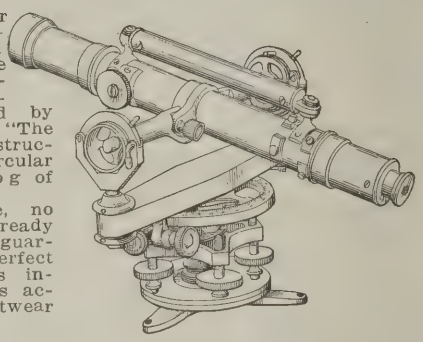


Send for Booklet E today and let us show you how you can save money by purchasing your Architects' Level now. Excellent instruments at surprising prices. Write at once.

The L. Beckmann Co.,
Estab. 1874 Toledo, Ohio
No. 300 Jackson St.

Improved Convertible Level

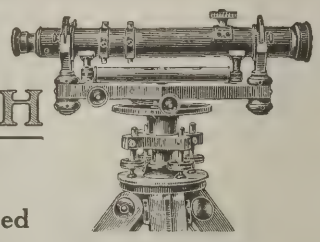
The instrument for the critical man—every part is made from the best grade material; each instrument is assembled and tested by expert workmen. "The acme of level construction." Ask for circular "B" and catalog of drawing material. No pins to lose, no screws to tighten, ready in an instant and guaranteed to give perfect satisfaction. This instrument holds its accuracy and will outwear any other.



New York Blue Print Paper Co., 102 Reade St., New York

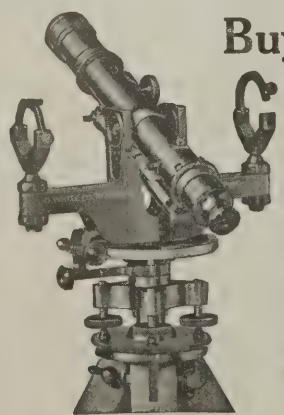
Buy a KOLESCH Level

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Here is a Level that has been designed and built especially for the requirements of Architects, Builders, and Contractors. It will surely pay you to have one, and avoid mistakes which might otherwise prove costly. Light in weight—thoroughly up-to-date in its construction—*sold at a reasonable price.*

KOLESCH & COMPANY, 138 Fulton St., New York



No. 2020

Buy a "WHITE" for Accuracy and Durability

The "White" convertible level is noted for its accuracy and durability. When you let a "White" control your lines and levels you can rest assured that your results will be **accurate and dependable.** The strong, sturdy make-up of the "White" level backs up its accuracy and enables it to stand years and years of hard and constant use on the job. Let us send you one for trial—no obligation. Circular tells all about it and quotes prices—**send for it.**

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN

desired. The gas supply pipe is ¾ in. diameter and the flue is 6 in. diameter. The statement is made that it operates with either natural or artificial gas or kerosene oil. The container slips out on side trunnions through the door in front, as shown in the illustrations, and it can be removed and replaced in a few seconds.

Fire Retardant Shingle Paints

The Educational Bureau of the Paint Manufacturers' Association of the United States has just issued an interesting pamphlet relating to fire retardant shingle paints and gives in connection with other matter a list of those licensed to make these paints under the formulas devised and specifications formulated by Henry A. Gardner, Director of the Scientific Section of the Educational Bureau and formally approved by that Bureau. It is stated in the pamphlet that "wood can be rendered measurably fireproof only by special treatment such as impregnation by mineral salts, but so far as has yet been discovered it cannot be rendered actually fireproof by the application of any surface coating." These paints are designed to resist ignition, to retard the spread of fire and to prevent the shingles themselves from acting as fire brands. For these purposes they are highly efficient as demonstrated by repeated tests. They will prevent the formation of inflammable fuzz and the curling or cupping of shingles which are both highly contributory to ignition and will retard the spread of flames to a marked degree. The full efficiency of these paints will be obtained by dipping the shingles before laying, brushing off the superfluous paint, allowing this coat to dry five days and finally applying the finishing coat to the outer side of the completed roof. It is good practice at the time of laying to paint the overlapping portion and lay the shingles while this partial coat is wet. This insures a moisture-proof joint. It has, however, no bearing on the fire retardant character of the coating. In the case of a roof already laid two coats of paint should be applied in dry weather allowing five days between coats. This treatment will materially reduce the fire hazard. Paint should never be applied to wet or moist wood. It will not adhere. Shingle roofs should be re-painted one coat once every two or three years."

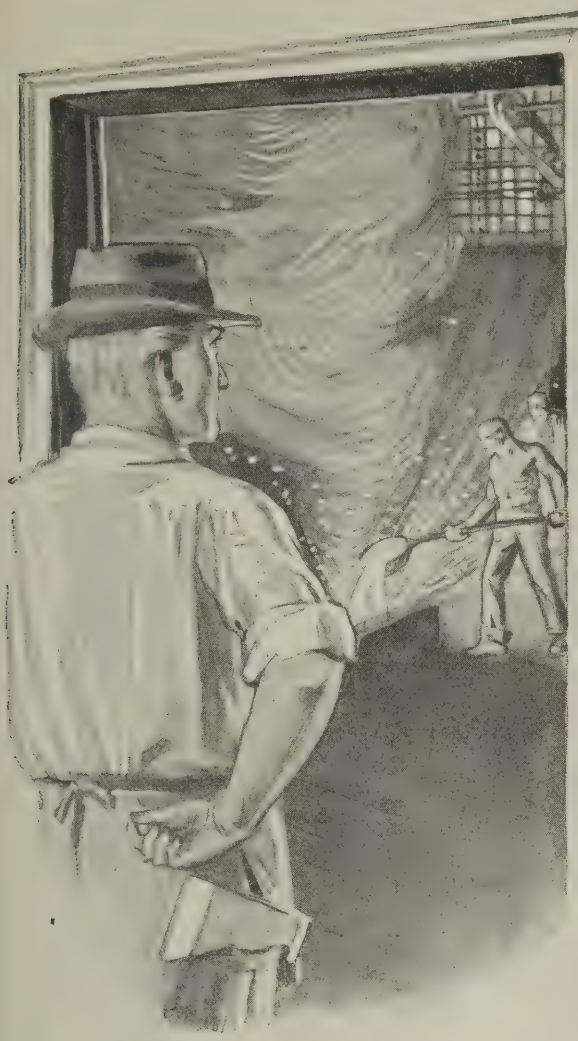
"Em-Pe-Co" Wall Board

An illustrated folder setting forth the merits of "Em-Pe-Co" Wall Board is being distributed by the Minneapolis Paper Company, Minneapolis, Minn. This material, it is claimed, will never crack, chip, warp, split or fade. The material comes in two widths—32 in. and 48 in. The 32-in. width is furnished in lengths of 6, 7, 8, 9, 10 and 12 ft., while the 48-in. width is furnished in lengths of 4, 6, 7, 8, 9, 10 and 12 ft. The folder also states prices. Another folder distributed by the same company in connection with this product describes the manner in which the material is applied, illustrations depicting the various steps as to the preparation, application and finishing necessary. The company is prepared to furnish samples of this wall board, which is said to be of pure wood fiber slowly cooked by a special process and then formed into panels under hydraulic pressure.

TRADE NOTES

Federal Motor Truck Company, Detroit, Mich., makes announcement that W. C. Rowley, for some time a member of the board of directors, has been elected vice-president of the company in charge of sales, the new duties having been assumed on Aug. 16. Mr. Rowley is regarded as one of the foremost transportation men in the country, and he therefore brings to his

(*Continued on page* 30)



Proof against sparks and fumes

Any roof should be *waterproof.*
RU-BER-OID is more: It is

SPARKPROOF ROTPROOF
WATERPROOF HEATPROOF
RUSTPROOF COLDPROOF

The Wheeling Iron and Steel Company, Wheeling, W. Va., states:

> "On our new tinning department, warehouse and machine shop buildings, having more than 60,000 square feet of roof area, we used RU-BER-OID Roofing exclusively. Experience has proved to us that RU-BER-OID is not injured by fumes, gases or smoke, that it resists fire, and extremes of heat and cold, and that it gives longer service without repairs."

Though RU-BER-OID costs a trifle more than other prepared roofing, it will save you money in the end.

Made in Slate Gray, Tile Red and Copper Green. Your dealer will show you samples and quote you prices.

THE STANDARD PAINT CO.
588 Woolworth Building, New York
BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete

The Paraffine Paint Co., San Francisco, (Under License)
The Standard Paint Co. of Canada, Limited, Montreal

Building Suggestions

Any books you check on this list will be sent you free. Write your name and address in the margin and state what kind of building you are planning.

- ☐ Roofing a Home
- ☐ Building a Poultry House
- ☐ Building a Bungalow
- ☐ Building a Barn
- ☐ Building Your Own Garage
- ☐ Covering Your Factory
- ☐ Artistic Roofs
- ☐ Waterproof Cellars and Stucco



Pronounced "RU" as in RUBY

RU-BER-OID ROOFING

COSTS MORE - WEARS LONGER

MADE BY THE STANDARD PAINT COMPANY, NEW YORK, BOSTON, CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid



The Hand of Experience

Uses

Hydrated Lime Plaster

BECAUSE

Hydrated Lime Plaster is the great sound deadener. It puts quiet in the home. Therefore, it is the ideal plaster for interior walls.

Tiny dead air cells are formed when this plaster hardens, and these cells absorb and prevent the transmission of sound. Therefore, it is the logical plaster to use for homes, schools and any places where quiet is necessary.

STRAIGHTER WALLS—Hydrated Lime Plaster is a slow setting plaster and in drying gives the plasterers time to finish the walls to true and even surfaces and angles. This slower set also permits the plasterer to eliminate lath cracks.

ECONOMIES—Hydrated Lime has a high sand carrying capacity. (Be sure to get our complete specifications, giving proportions of hydrated lime and sand.) There is no waste of material through droppings. These can all be retempered and used either the same day or the day after.

COSTS NO MORE THAN OTHER PLASTERS.

Write for our latest booklets containing complete information concerning Hydrated Lime Plaster

Hydrated Lime Bureau
of the National Lime Mfrs. Asso.
1509 Arrot Building Pittsburgh, Pa.

new position a complete knowledge of traffic methods. In accepting the new position, he states that he is fully convinced that one of the greatest problems in the world to-day is delivering goods to the consumer, and he therefore regards his new duties as only another phase of the problem that has been his life study.

Warren Webster & Company, Camden, N. J., announces the appointment of S. T. Vance as Washington District manager with offices at 301 Southern Building, Fifteenth and H. Streets, N. W., Washington, D. C.

Willis Mfg. Company, Galesburg, Ill., makes announcement that its skylights are offered in nine different styles, all of which are designed and constructed to be installed with the least possible labor and expense. The ridge and gutter bars are so formed that it is said to be impossible for the skylights to sag, buckle or spread. It is also stated that any carpenter can erect them with only a hammer and a screwdriver as tools.

The chief feature of the August issue of *Door-Ways*, the house organ of the Richards-Wilcox Mfg. Company, Aurora, Ill., is the contination of the interesting article entitled "Solving the Garage Door Problem," which deals with garage receding sliding-door equipment. The issue is accompanied by a calendar bearing the picture of a pretty girl illustrating the caption "The Tennis Player." On the reverse side of the calendar is stated the applicability of this caption to R. W. products.

A rather novel method of giving publicity to industrial matters and one which seems to be growing in popularity is by means of moving pictures. In this connection, it is interesting to note that a ten-minute series of moving pictures showing the manufacture of Portland Cement in its various stages was recently taken at the plant of the Knickerbocker Portland Ce-

(*Continued on page* 32)



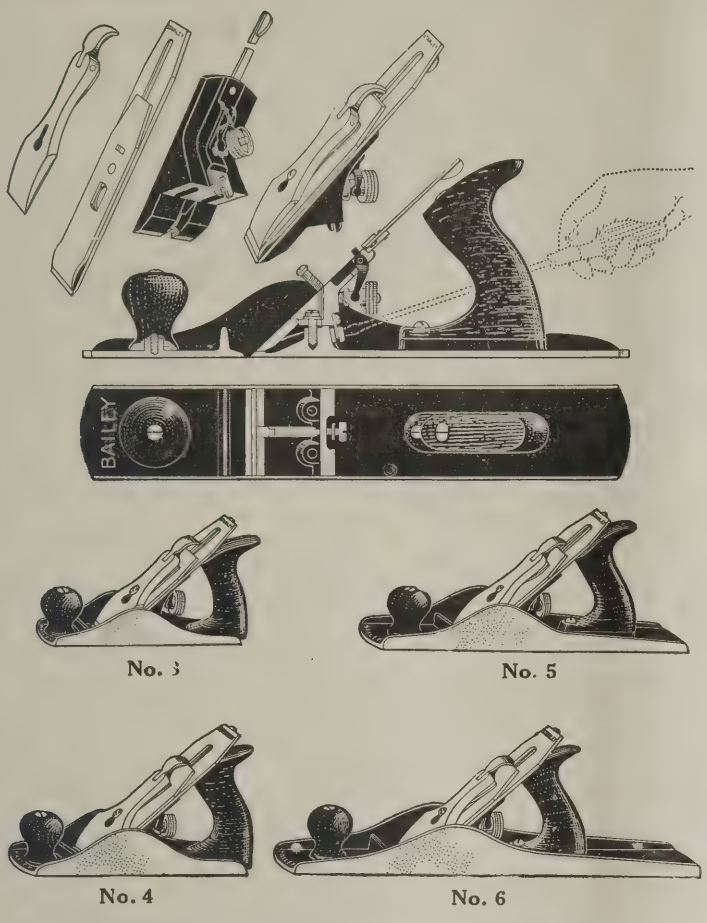
Reasons for choosing Sykes Expanded Cup Metal Lath

No furring strips are required.
Sykes requires less mortar.
Sykes keys perfectly. Can't be applied wrong.
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Insures a rigid wall. Saves you money.

SYKES EXPANDED CUP METAL LATH

Best for Interior as well as for Exterior work.
Indorsed by U. S. Government for Post Office work.
Write for free booklet of specifications and free sample of Sykes lath.

Sykes Metal Lath & Roofing Co.
494 Walnut Street Niles, Ohio



Stanley Tools

"BAILEY" ADJUSTABLE IRON PLANES

"BAILEY" IRON PLANES have been in use for nearly fifty years and are the recognized standard for planes of this type. While retaining all the original features, many valuable improvements in construction have been added from time to time.

In the illustration the detail of construction is very clearly shown. Note that the frog has a support directly at the rear of the mouth, making practically one solid piece from the cap to the bottom. The sides and bottom of the plane are stiffened by means of the cross ribs. The screw bosses on each side of the center rib are very deep, allowing a number of threads to engage, thereby securely holding the frog. The design prevents the plane being drawn out of true when the face of the frog is screwed up hard.

The width of the mouth may be regulated and made wider or narrower as coarse or fine work may require.

The cutter, which is thin and of uniform thickness, is a prominent feature of the "BAILEY" Plane.

Briefly, its advantages are: 1. Ease in grinding. 2. Less grinding, as a thin cutter can be kept in condition by honing. 3. Less tendency to "stub off" the cutting edge when honing, hence the original bevel is kept much longer.

It is adjustable endwise and sidewise, made of the finest quality English steel, tempered and ground by an improved process, and honed ready for use.

The handle and knob are made of highly finished, thoroughly seasoned rosewood.

All genuine "Bailey" Planes have the name "Bailey" cast in the bottom, and the name Stanley is stamped on the cutter. Planes with bottoms either flat or corrugated furnished as desired.

For Sale by All Hardware Dealers

Manufactured by

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.



Most of You Mechanics Use

DISSTON
SAWS AND TOOLS

Do You?

Ask any hardware dealer what saw the mechanic prefers and the chances are he'll tell you the **Disston.** Most mechanics **do** use the Disston—a recent investigation again proved that fact.

The endorsement of the majority of skilled artisans, men whose livelihood depends on tools, ought to be a pretty safe guide.

The chances are more than even that you use the Disston now; but if you don't, try them next time.

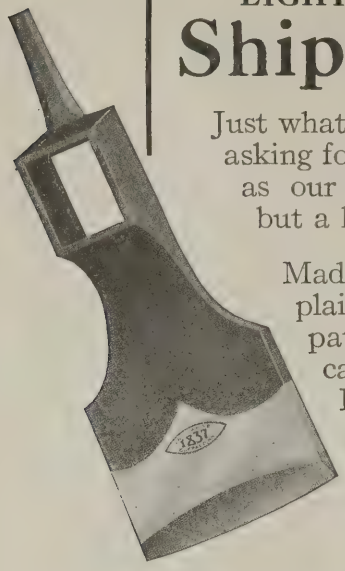
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LIGHT WEIGHT
Ship Adze



Just what you have been asking for. Same quality as our regular pattern but a light Adze.

Made in both the plain and lipped pattern. Our new catalog is ready. Drop us a card.

Ask your dealer for White Adze. Insist upon seeing our trademark.

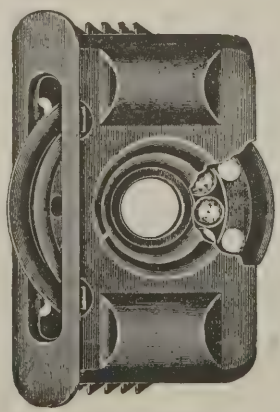
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100 PERRY ST. BUFFALO, N. Y.

ORIGINATORS
OF
SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government for** over **30 Years.**



The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.


No. 10 Ball Bearings

"Grand Rapids" All Steel Sash Pulleys

Fasten automatically. No nails. No screws. Just bore 4 holes.

The automatic saw tooth fastening feature and the easily made mortise will save in labor the cost of the pulleys.

Frictionless, Noiseless, Everlasting.

Write for free samples.

Grand Rapids Hardware Co.
160 Eleventh Street, Grand Rapids, Mich.

ment Co., with New York offices at 30 East Forty-second Street.

The Troy Wagon Works Company, Troy, N. Y., has been distributing a four-page folder giving briefly the characteristics of various materials entering into the construction of its products. A copy of the folder can be obtained by any reader of the BUILDING AGE on application to the address given.

Of interest to those concerned with chimneys are the two booklets which are being distributed by the M. W. Kellogg Company, New York City, and respectively entitled "The Story of the Chimney" and "The Building of a Modern Chimney." The first of these tells of the gradual growth of the chimney, and illustrations of historical interest emphasize important points in the text. The second booklet describes and illustrates the building of a modern chimney or factory stack, which is what the company specializes in.

In view of the increasing cost to the farmer of feed, the silo is an important adjunct to his equipment, and therefore the illustrations and descriptions contained in a booklet entitled "Cement Stave Silos" and distributed by the Portland Cement Association, 111 West Washington Street, Chicago, Ill., will undoubtedly prove of interest to the builder doing work in the agricultural districts of the country.

A booklet entitled "Organization and System" distributed by the Cincinnati Planer Company, Oakley, Cincinnati, Ohio, has for its purpose the dissemination among those likely to be interested, information pertaining to the plant, organization and system of the company.

George S. Smith has removed his office from 810 North Main Street to the northeast corner of Franklin and Channing Avenues, St. Louis, Mo., to which he invites a visit from his friends in the trade. The new shop is equipped to give emergency service of all kinds —to rebuild equipment and to take care of contractors' requirements of any kind. He states that he will also handle motor trucks and give the kind of service on them that a contractor needs.

One of the requirements of the Board of Fire Underwriters is that a swinging door must be locked at three points, and to meet this requirement the Dahlstrom Gravity Multiple Latch has been brought out by the Dahlstrom Metal Door Company, of Jamestown, N. Y.

The Ideal Way to Build
Use a Van Guilder Double Wall Concrete Machine
It builds double monolithic walls tied together and steel reinforced. Continuous air space, dry, warm, sanitary, fire proof, age proof, repair proof. Better than brick, cheaper than wood. Illustrations of buildings erected, and information "How to Build" Free.

VAN GUILDER DOUBLE WALL CO.
20 Wagner Building ROCHESTER, N. Y.

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞, weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-888 Progress St. Pittsburgh, Pa.

Containing Plans of This House; also a Colored Supplement with Plans and Details

Building Age



OCTOBER, 1917

PRICE 20 CENTS



Residence at Greenwich, Conn.,
Cross & Cross, Architects, New York

SPECIAL MOTTLED HUDSON SHINGLES

laid according to the Thatched Method were used on the roof of this building.

Hudson Shingles do not catch fire from sparks, and are approved by the National Board of Fire Underwriters.

Write us for samples and book entitled "Shingling and Roofing."

Asphalt Ready Roofing Co.

HUDSON ASPHALT ROOFING PRODUCTS

DEPT. 52

9 Church St., New York

FLOORS

The Wood-Mosaic Kind

WOOD-MOSAIC FLOORING TRADE MARK REGISTERED

For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips, Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

32 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory, New Albany, Ind.
Sales Office and Parquetry Factory, Rochester, N. Y.



Residence of Mrs. T. R. Baker, Clifton Park, Lakewood, O.
G. B. Bohm, Architect

Guardian of Your Buildings

When your building is finished, when from roof to basement it *just* suits you—call in the Bay Stater and let him keep it so.

Besides a preservative Bay State Coating is a beautifier. White and a variety of attractive tints offer a selection that meets individual tastes.

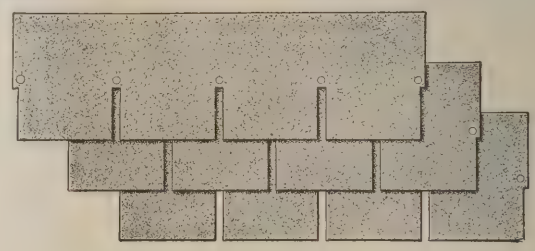
Entrust your handiwork to the Bay Stater's care. Write for Booklet No. 19, which tells you a lot about "Bay State" and ask for a sample which will prove all the book says. Do that today.

Wadsworth, Howland & Co., Inc.
Paint and Varnish Makers
Boston, Mass.
New York Office: Architects' Bldg.

BAY STATE
Brick and Cement Coating



REX STRIP SHINGLES



Save at Both Ends

DEALERS who sell and builders who use Rex Strip Shingles save in many ways.

These shingles cost less than individual shingles, and weigh only 185 pounds per square. Thus the dealer saves, even in freight, and passes his saving along to the builder—who in turn requires less nails and less labor of nailing than with individual shingles.

This combined saving makes it easier to sell the roof to the house owner.

Our Big Catalog No. 20 that tells all about Rex Strip Shingles—and other Rex Products—will be mailed (samples included) on request.

The Flintkote Company, Inc.

98 Pearl Street, Boston, Mass.

NEW YORK 1104 Equitable Bldg. CHICAGO 651 Peoples Gas Bldg. NEW ORLEANS 701 Hennen Bldg.



The Building Age

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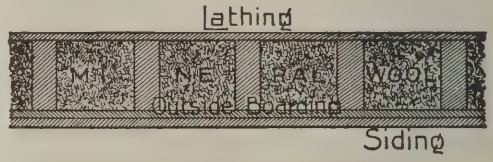
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BUILDING AGE

NEW YORK, OCTOBER, 1917

A Suburban Residence of Dutch Colonial Architecture

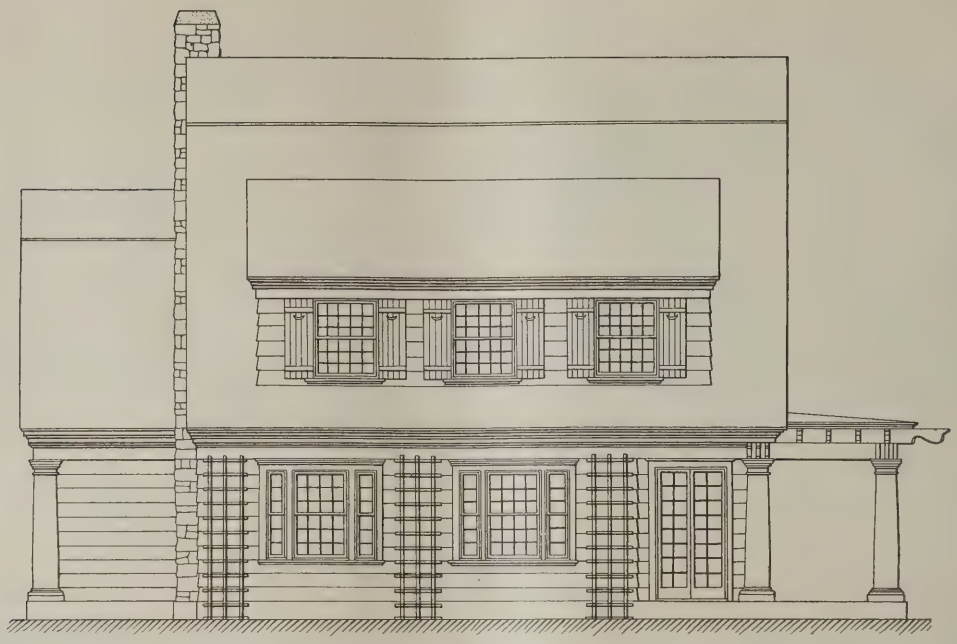
An Unusual Feature Is the Main Entrance Directly Through the Masonry of the Chimney

ROAMING through suburban and country districts of the country the observing builder comes in contact with dwellings of varied description, ranging through the many intermediary stages all the way from the modest cottage or gate lodge to the most pretentious mansion and varying in their architectural aspects from one extreme to the other. Many possess unique features of exterior treatment which immediately fix themselves upon the attention of the beholder and arouse his curiosity to know more of the construction and arrangement within.

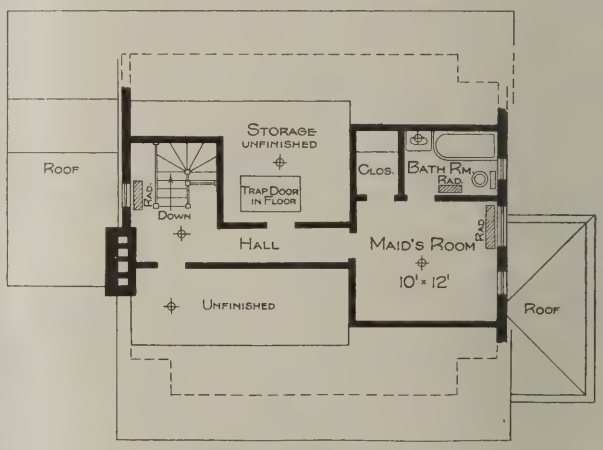
Such a dwelling forms the basis of the present article, the striking feature here being the main entrance to the house directly through the masonry of the outside chimney. At the right of the entrance doorway, the chimney takes care of the living-room fireplace, which is built into it at this point, and also of the flues from the cellar. The left side of the chimney takes care of the flue from



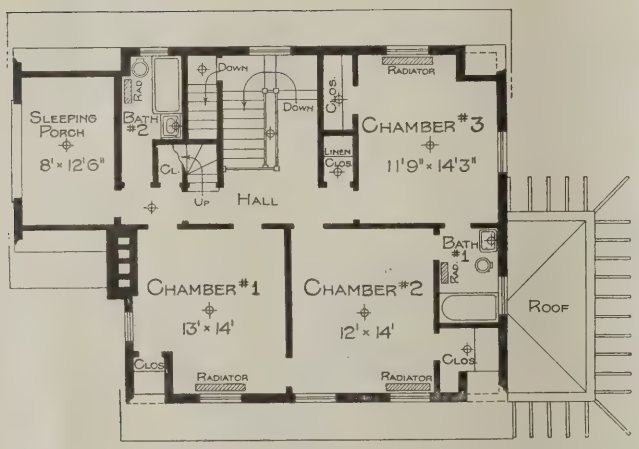
A Photographic View of the Completed Dwelling with Its Picturesque Setting—Smith & Davis, Architects, New York City



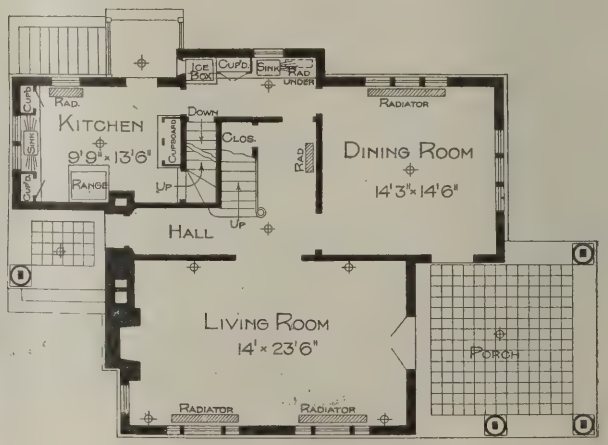
Front Elevation of the House—Scale 3/32 In. to the Foot



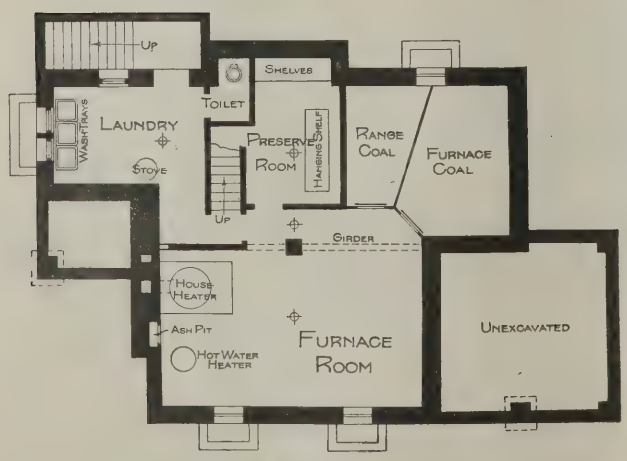
Plan of Attic—Scale 1/16 In. to the Foot



Second Floor Plan—Scale 1/16 In. to the Foot



First Floor Plan—Scale 1/16 In. to the Foot



Basement Plan

The Front Elevation and the Floor Plans of the Dutch Colonial Suburban Residence

the kitchen range, the flue lining at the point where it is carried over the doorway being of cast iron.

The dominating lines of the house are Dutch Colonial, with the gambrel, however, broken further up than is commonly the case, so that the lower part of it comes down in a steep slope, and then turns outward with a graceful sweep. The triple dormer breaks the lower roof lines and gives light and head room to the front rooms on the second floor.

At the extreme right is a porch with pergola effect. At the extreme left end of the house is the kitchen, and the overhang forms a protection from the weather for the entrance doorway. Lattice is effectively placed on the main story on each side of the window, for trailing vines thus, aiding greatly in giving that adaptability to site so necessary to the Dutch Colonial house.

Just over the kitchen can be seen a large window with curved head casing which gives light to the sleeping porch. The rear of the house is rendered commodious by a dormer similar to the one in front.

The shutters are of the familiar Colonial type and have the customary crescent-shaped saw cut in them.

The color scheme is the one so typical of Colonial houses—green shutters and white clapboarding, together with roof shingles of a greenish brown tinge.

The entrance through the chimney leads into a small hall, at the right of which is the living room with large fireplace of brick and wood combined. At the right of the fireplace are bookcases with diamond-shaped panes of glass that are also Colonial in spirit. At the far end of the living room are casement windows opening onto the porch, which latter has a floor of old stone flagging broken at random into different shapes and sizes, laid over a cinder-concrete bed. The porch also communicates with the dining room by casement windows.

At the far end of the hall is the dining room, two views of which we present in the accompanying illustrations. The trim is Colonial, the panel and wainscoting being particularly so. The dining room communicates with the kitchen by means of a pantry which can also be reached from the hall.

The kitchen is conveniently arranged, the sink being placed beneath two windows so as to receive plenty of light. At each side of the sink is a cupboard. There is also a cupboard at the entrance to the kitchen.



View in the Living Room Looking Toward the Open Fireplace

The second story contains three bed rooms, a sleeping porch and two bathrooms, one of the latter communicating with two of the bed rooms. At the left of the main stair well is a flight leading to the attic, containing a maid's room and a bathroom together with ample storage.

The footings of the house are composed of large stones and are 8 in. wider than the foundation wall. The latter is composed of blue stone taken from the ground in the vicinity of the site and was laid in cement mortar mixed in the proportions of one of cement to 2½ of sand. The outside of the founda-

tion wall was coated with Portland cement mortar to the sill.

The chimney is also constructed of blue stone laid up in Portland cement mortar, and the flue linings are of tile, excepting it is of cast iron where the kitchen flue runs across the doorway. The chimney has a cement cap.

The framing timbers are of spruce, the sills being 4 x 6 in.; the posts 4 x 6 in., tenoned into the sill and the floor joists 2 x 10 in., on centers. Where the joists rest on a masonry wall, they are fastened by beam anchors of the Goetz box anchor type and set not over 4 ft. on centers. The beams resting on the masonry wall have their ends bevelled 3 in.

The floor joists are bridged by 2 x 3 in. stock in between the joists with concrete to a level of 6 in. above the floor line.

The rafters are covered with 1 x 2 in. shingle lath which received 18 in. red cedar shingles exposed 5½ in. to the weather. The underhangs were ceiled with ⅞ x 3 in. North Carolina pine ceiling boards laid with close joints and blind nailed. The overhangs were given three coats of best light hard oil varnish. The flashings were of 16 oz. hard rolled copper.

The walls were covered with ⅞ x 8 in. shiplap, lapjointed and surfaced North Carolina pine boards laid diagonally and nailed with 8d nails. Over the sheating was placed black Neponset building paper lapped at least 6 in. This in turn received 12 in.



The Dining Room, with Door to Porch at the Left and a Glimpse of the Living Room Fireplace Across the Hall at the Right

once in every span over 8 ft. and twice in every span over 16 ft. The attic ceiling joists are 2 x 4 in. The studs are 2 x 4 and 2 x 6 in., doubled at the tops and sides of all openings. The wall plates are 4 x 4 in., rafters 2 x 8 in. set 24 in. on centers, valley and hip rafters 2 x 8 in., collar beams 1 x 6 in. Headers and trimmers are doubled.

Framing around chimneys, fireplaces, stairs, etc., is of mortise and tenon joints well spiked. Headers over 6 ft. long are hung in stirrup irons. No framing was allowed within 2 in. of the chimney. Openings over 3 ft. are trussed, and under this width 4 x 4 in. lintels were used. The pergola plates are 4 x 10 in. The space at the foot of all studs is filled

cedar siding exposed 10 in. to the weather. All corners were mitered with cove mold between the masonry and weather boards. The latter were given three coats of pure linseed oil and white lead.

The exterior trim is of white pine. The ceiling of the entrance porch roof was sheathed and the space between the floor above and the porch ceiling was filled with mineral wool.

The principal doors throughout the house are of the single panel type. A plate glass mirror is in the door of the owner's bed room.

Windows are of both casement and double hung type. The glazing is double thick American glass.

The main stairs are set on 3 x 6 in. carriage

timbers spiked in place after the stairs were up. The main stairs for the first and second floors have treads 1¼ in. thick and risers ⅞ in. thick tongued and grooved together and housed into the wall frames, being wedged, glued and blocked. The newels are of birch 5 in. square, ballasters are 1½ x 1½ in. and placed three to a tread. The stair treads and rails are of mahogany. The stairs leading to the cellar are of spruce.

The sub floors of the main sections of the house are of ⅞ x 6 in. dressed hemlock run at right angles to the floor joists. Over this was placed rosin sized building paper. The finish floors in the first story are quartered oak laid herringbone fashion with a 12 in. border. At completion these were given one coat of shellac and two coats of wax well rubbed in. The finish floors in the other sections of the house are of ⅞ x 2½ in. North Carolina pine laid with a border. At completion these boards were oiled two coats well rubbed in.

The interior trim is of clear birch primed on the back before being set in position, and given a coat of Pratt & Lambert's shellac and varnish. The trim in the basement and the third floor is of straight grained cypress. All interior woodwork was given four coats of white paint and one of enamel.

The walls were lathed with spruce lath placed 3-16 of an inch apart and plastered with King's Windsor cement, the work being two coat. Metal corner beads were placed on all corners and angles.

The floor of the sleeping porch is of ⅞ x 6 in. hemlock over which was laid 10 oz. duck, this being turned up at the wall 9 in. where was placed a 10 in. x 1½ in. base.

The bath room floor is constructed of a filling of cinder concrete upon which was placed a bed of Portland cement mortar of a 1:2 mix which in turn received 2 in. hexagonal tile. The walls were laid up with 4 x 4 in. American Eucasustic white tile. The water closet was set upon a floor slab of Vermont marble 2 ft. square. The fixtures include Mott's "Euclid" enameled iron corner bath tubs 24 x 20 in. "Velasco" extra heavy vitreous lavatory with vitreous pedestals; No. 1 water closet combination, etc.



Another View of the Dining Room Looking Out Upon the Open Porch Through the Door at the Right in the Background of the Picture

The kitchen is provided with built-in dressers and has a 30 x 20 in. Speakman enameled iron roll rim sink with integral back.

The house is lighted by means of electricity. The heating is a two pipe hot water direct system calculated to provide a temperature of 70 deg. within the house when it is zero weather outside.

This residence is located on Oak Ave. in Kissena Park, Flushing, Long Island, N. Y., and was erected for W. P. Smith, in accordance with plans and specifications prepared by Architects Smith & Davis, 16 East 47th Street, New York City.

The Ventilation of Dwelling Houses

Neglect to Provide for Air Change Quite General — Part Played by the Fireplace

By S. K. T.

ONE of the features of every building period is the erection of homes, which in many cases have no intelligent provision made for their ventilation at the season when the conditions prohibit the opening of windows for the purpose of changing the air. This observation is prompted by the following, which was prepared in response to an inquiry for information on the ventilation of American homes.

Little Information on the Subject

The ventilation of a home is a subject on which there is very little information. In some instances no provision is made for ventilation. It is a matter of record that the investigation of engineers shows that, regardless of any provision for ventilation, the porosity of the material of which buildings are constructed and the leakage around doors and windows and similar openings provide one change of air per hour in a building. Heating engineers make a provision for heating this amount of air in order to maintain a comfortable temperature when figuring the heating requirements. That may be called natural or compulsory ventilation.

In a large number of the more expensive residences or mansions a number of open fireplaces are provided, and as a rule there is a fire going in an apparatus connected with some one of the flues in the chimney which serve these open fireplaces. Consequently, the heat of the chimney induces an updraft and the fireplace serves as a ventilator even when there is no fire in it. In effect this is very apt to cause a low temperature near the floor of buildings because nothing can go out of the chimney in the way of air unless other air comes into the room to take its place, and if the temperature outdoors happens to be zero or below, the temperature up to the height of the opening into the fireplace is apt to be different from what is desirable, even though the upper part of the room might be at an uncomfortably high temperature.

Effect of Using Several Fireplaces

Then, again, the use of several fireplaces may over-ventilate the building and take out more hot air than the heating apparatus is arranged to supply. So much for that form of ventilation.

In isolated instances small registers have been placed in the baseboard of different rooms, opening into the space between the studs in the partition, and this space has been connected by means of studs of about the same size with a large central shaft or duct passing through the roof and terminating in one of the so-called ventilators, chimney caps or constructions which exert an exhaust current when a wind is blowing. Some of these ventilators are said to work effectively with as low wind velocity as 3 miles per hour.

Very few of this character of installations are made. There is one or two in the vicinity of Philadelphia. In the rectory of a church in Cincinnati, Ohio, ducts of this character were led from the bathrooms, toilet rooms and two of the bedrooms to a ventilator of this sort.

Again, in connection with a chimney used in carrying away the products of combustion from the heating apparatus, exhaust ventilation is sometimes accomplished by running the smokestack up through the flue and then placing registers in the flue so that the space around the smokestacks could be utilized for exhausting the air to make room for fresh air. This is most frequently done in connection with the warm-air furnace heating systems, yet it can be used in connection with direct steam and hot-water systems just as readily.

Use of Ventilating Systems

There has also been installed a number of ventilating systems on which patents have been taken out. Here again registers 3 or 4 in. in diameter are placed at two or three or more places in the baseboard of a room, according to the size. These 3-in. pipes lead down to a general duct which enlarges as different connections are made with it, and the various ducts from different sides and parts of the building connect with a main duct which connects with the smoke pipe of the heating apparatus, so that the draft to the chimney is depended upon to do ventilation work. When the check draft is open, the air passes from the accumulating exhaust drum into the check draft and up the chimney. When the fire is to be forced, the check draft is closed and then the air enters the ashpit and passes under the grate, through the fire and up the chimney in that way.

This certainly makes it easier for hot air from the piping and registers of a furnace to enter the rooms, and facilitates their heating in cases where the rooms might otherwise be considered air bound and difficult to heat.

While the installation of such equipment is not very expensive, the appreciation of ventilation by the general public is not such as to create any substantial demand for it, although it is hoped it will grow in favor.



Appearance of the Finished Horse Barn on the Oakdale Farm at Ogden, Iowa

A Commodious Frame Barn For Horses

Plank Frame System of Construction —Practical Details for the Builder

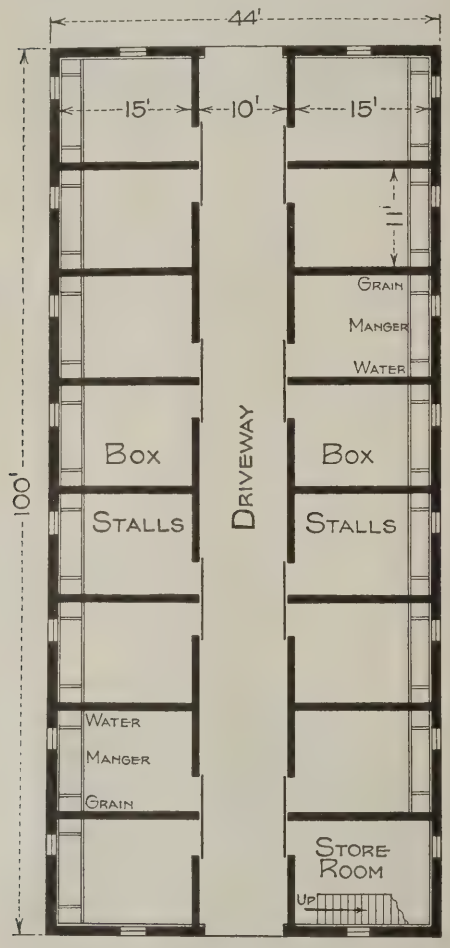
By W. E. Frudden

BARN construction is something in which the practical builder is always interested, more especially if he is doing work in the rural and agricultural districts of the country, and he will therefore find much in the illustrations and descriptive data here presented to command his attention. The subject of the article is a frame barn intended originally for Belgian horses, the

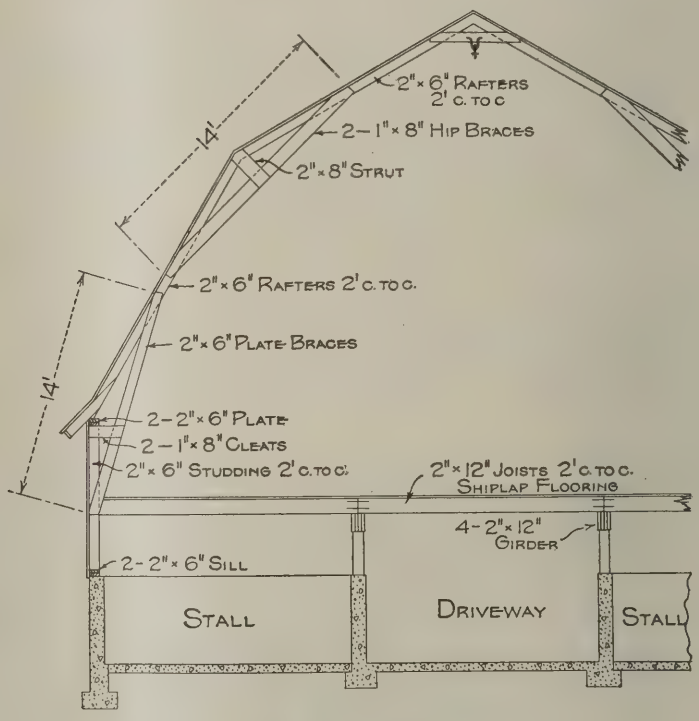


View in the Barn Looking Along the Driveway and Showing the Box Stalls for Horses on Either Side—Note the Construction of the Upper Sections

owner being a large importer of these animals before the present world-wide war began, but since the great conflict has put a stop to all importation of horses, the owner of this farm, which is known as the Oakdale, located at Ogden in Boone County, Iowa, is raising his own horses, and has won a number of prizes with his stock at fairs in the last two or three years. The farm is owned by C. G. Good, who has fully a quarter of an acre in barns. The one here illustrated and described is the largest and most modern on the place, and is perhaps as well equipped as any of its kind in that section of the country. It is built upon the plank frame system, and some idea of the details may be gathered from the vertical cross section on the following page.



Floor Plan



Vertical Cross Section Showing Framing

A Commodious Frame Barn for Horses

The girders are made up of four pieces of 2 x 12-in. timbers, and the sills of two pieces of 2 x 6-in. material. The studs are 2 x 6 in. placed 2 ft. on centers, the plates are made up of two pieces of 2 x 6-in. stuff and the plate braces are of 2 x 6-in. material, as are also the rafters, the latter being placed 2 ft. on centers. The struts are 2 x 8 in. The hip braces are made up of two pieces of 1 x 8-in. material, and the cleats are similarly constructed. The floor joists are 2 x 12 in. placed 2 ft. on centers, and support the ship-lap floor.

The outside of the frame is covered with drop siding, while the roof is self-supporting. The frame is referred to as being very simple to erect, but it has withstood the elements and appears to be rigid in every respect. There are no heavy timbers in the building, but all are short length, which means economy in the way of building material.

An examination of the floor plan shows a 10-ft. driveway extending through the barn, which, by the way, covers an area of 44 x 100 ft. There are box stalls on each side of the driveway, these stalls being 15 ft. in length and 11 ft. in width, each one being provided with a chute for grain and also a manger for holding the feed as well as a watering trough. These feed boxes and watering troughs are of concrete and are built right into the walls.

The foundation of the barn through a height of 5 ft. is of concrete, and the same material is used in the walls of the stalls on the inside of the barn. The driveway floor is concrete and the stall floors are clay with a drainage base of coarse gravel. A window in each stall admits plenty of light and allows for good ventilation in warm weather.

On the second floor of the barn everything is well arranged in regard to the feeding requirements, as a large part of the work is done here. The hay mow holds in all 100 tons of loose hay without crowding it. Large bins are provided at one end of the mow and there are also electric motors to run the feed cutters and the grinders. The feed for the horses is placed in the galvanized iron troughs in the stalls below by means of the feed spout which leads from the hay mow to the stalls. There is a hay chute to each stall, thus rendering it possible to place hay before each horse without the necessity of entering the stall. Bedding is also thrown down through the same chute.

The hay in the mow is piled up in the center leaving planty of room along both sides to walk back and forth in order to readily get to the feed spout. An idea of the hay mow may be gathered from one of the pictures presented herewith, which represents an interior view under the rafters and at the same time clearly shows the framing in connection with the roof.

Value of Suspended Ceilings in Theatres

In discussing the above subject, J. M. Hessing, a lathing contractor in St. Louis, Mo., says:

"Suspended ceilings are a practical necessity in every theater because of their value in preventing unsatisfactory conditions of acoustics and ventilation, as well as from a structural viewpoint.

"If this type of ceiling is not used, the acoustics of the auditorium will be very poor because of the breaking up of sound by the large roof trusses or girders which project down into the room.

"If the under side of a roof constructed of solid material is finished as the ceiling of the room, moisture will collect on the ceiling and form into large drops. These drops will fall off, to the great annoyance of the audience. This 'sweating' will also ruin the decorations on the ceiling and, as it occurs constantly, will make it impossible to keep the decorations looking attractive.

"Without suspended ceilings the heat from the roof makes the room very uncomfortable during the summer because there is no means for ventilating the upper part of auditorium so as to remove this heated air.

"When suspended ceilings are used, the space between the ceiling and the roof forms a plenium chamber which may be utilized for ventilating the theater. This can be accomplished by placing registers in the ceiling when it is erected and installing an exhaust fan to draw the impure air from the plenium chamber so formed.

"The suspended ceiling is placed below the trusses and roof beams, thus doing away with the necessity for plastering the sides and soffits of these beams and trusses. The saving in the amount of plaster which would be required for this work will go a long way toward paying the cost of a suspended ceiling.

"When this type of construction is used, it will not be necessary to fireproof the roof trusses or girders. This is another considerable saving which may be used to pay the cost of the suspended ceiling.

"When the suspended ceiling is used below a concrete roof, it is not necessary to apply a wash to the concrete. And if the roof be reinforced with a ribbed lath it will not be necessary to plaster the under side of the roof. These also are savings which may be used to cover a part of the cost for the suspended ceiling.

"It is poor judgment not to put in suspended ceilings when the theater is being built, for in nearly every instance they will have to be put in



View in Frame Barn for Horses Showing the Roof Construction

after the building is completed. This will cost about twice as much as it would if they were erected at the time of building. In addition to this there is the loss due to closing down the house while the work is being done and the inconvenience and damage from dust and dirt occasioned by the work."

Laying Out the Building Site

In construction work the delivery of building material is too often made in a more or less haphazard way, and the material placed on the site in whatever spot comes handy. As a result, the site becomes a confusing and rather heterogeneous mass of lumber, brick, sand and whatever else is to be used during the work. Such a lack of system apparently saves time at the start, but almost invariably leads to delays and loss of money before the job ends. No successful building contractor starts a job to-day without carefully scheduling his building materials both as to time and place of delivery.



Picture of a Building Operation Showing the Distribution of the Materials, Offices, Tool Shed, Saw Mill, Etc.

He lays out his site on nearby ground, designating the exact locations for each and every size of lumber, for the brick, the stone, the sand, the cement and whatever is to go into the proposed structure. The accompanying reproduction of a picture of one of the Aberthaw Construction Co.'s jobs is the type of site layout that adds to the speed and smooth running of any job.

In the picture, the regularity with which all lumber piles have been placed is particularly evident. Each pile represents lumber for a certain definite job, and it is so piled that it can be obtained with the greatest ease and speed possible. In the foreground is one of the offices and in the left background is the company's field office. Behind that is the tool shed. The building under construction is just across the road at the left of the picture. In the sawmill in the background the lumber is cut up and piled as shown ready to be made into "forms."

As the lumber arrives on the job it is piled in the handiest position for carrying to the sawmill. The Aberthaw Company says that time spent in piling the lumber properly is much more than made up by the convenience later on the job.

Another feature of the company's systematic methods of handling a construction job is the complete designing and laying out of all formwork in the office and the scheduling of the exact sizes and number of boards to be used in their construction. By so doing no time is lost in putting the work through the sawmill. Just enough lumber is sawed for taking care of all the "forms" desired.

Brick and Tile Production in 1916

Large increases in the value of brick and tile made in the United States in 1916 are reported to the United States Geological Survey, Department of the Interior. The total output amounted to $159,042,849, an increase of $33,248,005, or more than 26 per cent over the figures for 1915. The value of every variety of product classified by the Geological Survey except two was increased. Common brick, the output of which has been declining in recent years, showed a large increase in both quantity and value. There were 7,394,202,000 brick reported for 1916, valued at $49,357,411, or $6.68 per thousand, an increase in quantity of 543,103,000 brick and in value of $7,212,119, or 17 per cent.

The front brick industry showed a considerable gain, its output being valued at $11,464,614, an increase of $1,929,078, or 20 per cent. Draintile and architectural terra cotta also showed large increases over 1915. Tile (not drain) valued at $6,475,464—consisting of roofing tile ($914,240), floor tile ($1,438,231), ceramic mosaic tile ($1,308,861), faience tile ($814,077), and wall tile ($2,000,055)—showed a gain of $1,289,409, or 25 per cent.

Brick and tile products are classified naturally into three divisions, (1) structural materials, (2) engineering and refractory products, and (3) miscellaneous wares. Structural materials, including building brick of all kinds, terra cotta, fireproofing, and tile (not drain) was valued at $84,643,252 in 1916, an increase of $14,234,136, or 20 per cent over 1915.

Pennsylvania was the leading State in the production of brick and tile, reporting these wares to the value of $29,630,563, or 19 per cent of the total, an increase of $8,732,281 over 1915. Ohio ranked second, with products valued at $25,506,344, or 16 per cent of the total, an increase of $4,596,502. Illinois was third, with products valued at $16,507,845, an increase of $2,664,799 over 1915. New Jersey was fourth and New York fifth, with products valued at $9,749,524, and $8,410,340 respectively, both States showing large increases in value compared with 1915.

Investigations by the Forest Products Laboratory, at Madison, Wis., have resulted in the use of spent tanbark in the manufacture of asphalt shingles to the extent of 160 tons per week. The value of the bark has been thereby increased from 60 cents to $2.50 per ton.



Fig. 1—Appearance of the Front of the Office, Showing the Typical Colonial Entrance

A Suburban Real Estate Office

Attractive Features of a Building Designed for Visitors on the Property

MUCH of the attractive architecture which beautifies the suburbs of New York City is located in Westchester County, which section takes care of part of the natural overflow of population from the near-by metropolis. Here development companies are active and many of the country districts of this county owe much of their building activity to these concerns.

In that section of New Rochelle known as Wykagyl Park many natural and historical advantages are to be found. As one approaches the main entrance to this section there is presented a vista of rolling hills sloping upward from the shimmering beauty of a placid lake from whose bosom a little stream trickles down under a rustic bridge and past the old historic homestead of Tom Paine.

In this spot, in a small triangle formed by the crossing of two roads, is located the office of one of the companies referred to above. Its Colonial type of architecture seems particularly suited to the surroundings. Indeed, many of the residences in this locality are of the Colonial type, and harmonize most impressively one with the other.

The office is plain, yet well proportioned. As shown in one of the illustrations, a simple Colonial doorway leads into the main office of the building, an interior view of which, looking from the porch doorway, is given in one of the pictures.



Fig. 2—Interior of the Office, as Viewed from the Porch Doorway at the Left



Fig. 3—View from the Left Side

A massive stone fireplace is the most prominent feature of the room. The trim, as can be seen from a glance at the pictures, is simple and Colonial in its characteristics. Beyond through the open door can be seen a private office. The closed door at the left leads into a small toilet.

A detail of the porch at the left is shown in Fig. 3, which, together with Fig. 1, give an excellent idea of the roof line, which constitutes much of the beauty of the design.

The sides of the building are covered with white shingles, and the roof with shingles mottled green in tone. The familiar Colonial shutters with the crescent-shaped saw cut therein form a conventional feature of the building. Flower boxes supported on brackets are placed beneath each window and add the finishing touch, which seems so appropriate to any building of Colonial design.

This office affords a most pleasant impression to the visitor who is desirous of inspecting the various properties, as he has the opportunity of looking over blueprints which are on hand or to discuss various features which he may be desirous of having incorporated in his home.

The building was erected by W. L. Hayes, 230 Huguenot Street, New Rochelle, N. Y.

Further Discussion of Roof Framing

Drafting Necessary in Some Cases Before Using the Steel Square in Framing Roofs

By W. S. Wilkin



WHILE the subject of roof framing with the use of the steel square has been considered to more or less extent in the columns of the paper, there are some roofs which require drafting before we are able to use the square in framing them. We must have certain dimensions to use on the blade and tongue of the square before we can do the work to the best advantage. In Fig. 1 of the diagrams is represented what we might find on the rear end of almost any storeroom —a square hip roof. Fig. 2 represents the front end of the roof on the same building which is out of square. We often find this where the streets do not run truly north and south or east and west. The roof shown in Fig. 1 can be framed with the steel square without doing any drafting, but the writer has made the drawing so that the reader will understand why certain figures on the steel square will give the cuts.

Finding Various Bevels

First draw the plate line *a-b-c-d;* then the center line of the ridge *e-f* and extend it to *j* as shown. Draw the plan of the hips *b-e* and *c-e*, also the plan of the common rafter *a-e*. Lay off the rise *e-f* and draw *a-f* which is the length of the common rafter. The bevel at *a* is the seat cut and at *f* the plumb cut. Now with *a* as center and *f-a* as radius, turn over to *h*, then *a-h* is also the length of the common rafter and the bevel at *h* is the side cut for all the jacks.

To get this bevel with the steel square take *a-b* on the blade and *a-h* on the tongue and the tongue will give the cut. To find the lengths of the jacks space them on the plate line as shown. Draw a line from these points to the line *b-h* as shown at *h'* and *h''*. This will give the length of each jack.

Now draw a line at right angles to the plan of the hip *b-e* until it strikes the center line of the roof as *b-j*. Lay off the rise *e-g* and draw *b-g*, which gives the plumb and seat cuts. Next with *b* as center and radius *b-g* turn over to *i* and draw *j-i*. The bevel at *i* is the side cut of the hip or valley to

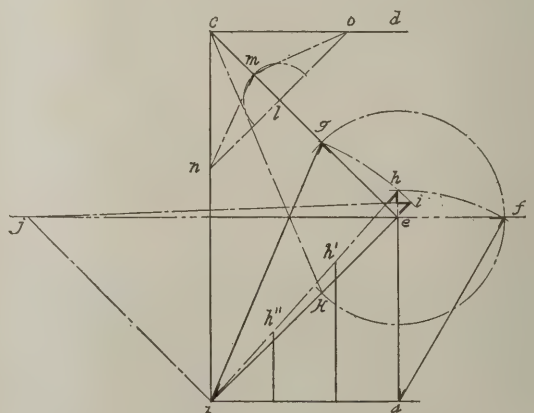


Fig. 1—Layout of a Square Hip Roof

fit against the ridge. To get this cut with the steel square take *b-j* on the blade and *b-i* on the tongue; the tongue will give the cut.

Some say this bevel is the same as the side cut of the jacks but in this I do not agree, for while the rise of the hip and common rafter are both the same, the run of the hip is the longer which makes

the bevel different. I have made Fig. 2 much larger than Fig. 1 owing to the number of lines involved. Referring to this diagram *a-b-c* is the plate line; draw *f-j* to represent the center line of the roof; bisect the angles *b* and *c*. This will give the plan line of the two hips as *c-e* and *b-e*. There will be one long hip and one short hip. Now draw the line *a-d* at right angles to the center line of the roof. Lay off the rise *e-f* and draw *f-a* and *f-d*, which will give the seat and plumb cuts of the common rafter just the same as in Fig. 1.

Now with *e* as center and *e-f* as radius, draw the arc as shown, which will mark the rise of the hips and the common rafter on the end of the roof. Now draw *i-o* and *o* gives the seat cut, while the bevel at *i* gives the plumb cut for this rafter, *o-i* giving the length. Now draw *g-b*, which is the length of the long hip, and also give the seat and plumb cut for it. Draw *c-h*, which is the length of the short hip and gives the seat and plumb cut for it. The common rafter on this end of the roof is a little longer than on the other end of the roof or the other common rafters.

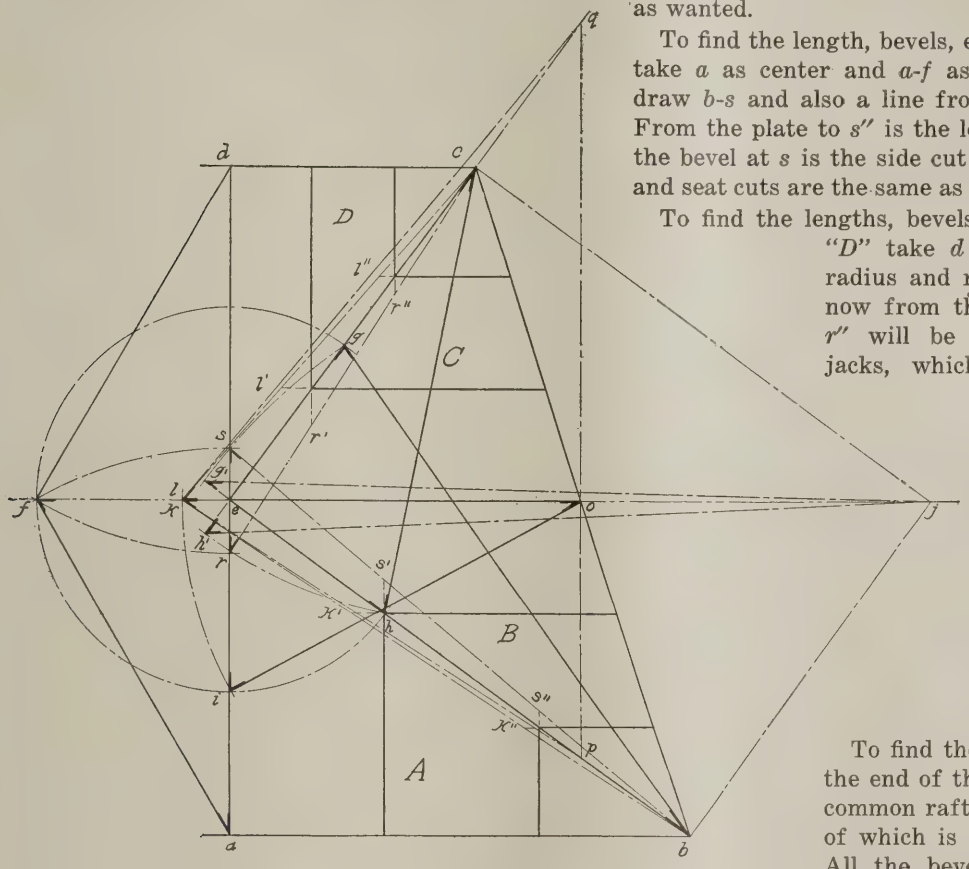


Fig. 2—Layout of front end of roof on same building as Fig 1 but which is "out of square"

We now have the length, seat and plumb cuts for the common rafters and hips and we must next find the length and the side bevel for the jacks and hips. In order to obtain the side bevel for the hips proceed as in Fig. 1. With *b* as center and *b-g* as radius, revolve to *g'*, then draw *j-g'* and the bevel at *g'* is the side bevel of the long hip to fit against the ridge. The point at *j* is found as in Fig. 1 by drawing the lines at right angles to the hips until they cut the extended center line of the roof. Now draw *c-h* and with *c* as center and *c-h* as radius revolve to *h'*. Draw *j-h'* and the bevel at *h'* is the side bevel for the hip.

All the jacks on the end of the roof in Fig. 1 are the same length and require the same bevels, etc., but in this end of the roof, Fig. 2, it will be seen they are different. I have marked them *"A," "B," "C"* and *"D."* As was the case in Fig. 1, we will use the common rafter to find the length, seat and plumb cut, also the side bevel for the jacks. The plate may be divided into equal spaces for as many jacks as wanted.

To find the length, bevels, etc., for the jacks in *A*, take *a* as center and *a-f* as radius; revolve to *s*, draw *b-s* and also a line from the plate line to *s'*. From the plate to *s''* is the length of the jacks and the bevel at *s* is the side cut for them. The plumb and seat cuts are the same as for the common rafter.

To find the lengths, bevels, etc., of the jacks in *"D"* take *d* as center and *d-f* as radius and revolve to *r;* draw *c-r*, now from the plate line to *r'* and *r''* will be the lengths of these jacks, which if spaced as here shown will be the same length as in *"A"* and the plumb and seat cuts will be the same as in connection with the common rafter *d-f*. The side cut is shown at *r*. It is different from the bevel shown at *s* owing to the difference in the hips.

To find the bevel of the jacks on the end of the building, we use the common rafter on the end, the plan of which is *o-e* and the length *o-i*. All the bevels given are for the square edge of the rafter before the hip or valley has been backed or grooved and before the jacks on the end of the roof have been beveled on the top edge.

First we must get a line at right angles to the plan *o-e* owing to the fact that the plate is at right angles to the common rafter on the side of the roof and the lines *b-j* and *c-j* are at right angles to the hips. Draw *p-q* passing through *o*, touching the long hip in the point *p* and the extended line of the short hip in *q*. The plumb and seat cuts of these jacks are the same as the bevels at *o* and *i* but to find the side bevel take *o* as center and *o-i* as radius and revolve to the point *k-l*. Now draw lines from *k-l* to *p* and *q* and the bevel at *k* is the side cut for the jacks in *"B"* and the bevel at *l* is the side cut for the jacks in *"C."* These lines, however, will not give the lengths of the jacks. To find them, draw lines from *k-l* to *b* and *c*, then from the plate line to *k'* and *k."* This will give the lengths of the jacks in

"B." Draw from the plate line to *l'* and *l"*, which will give the lengths of the jacks in *"C."* In this case the jacks in *"B"* and *"C"* are both the same length, but if there were three jacks in *"B"* so as to make the jacks in *"A"* closer together, the length would be different, but the bevels would still be the same.

From what is here presented, the writer feels that most anyone should be able to frame any ordinary roof with straight plates and straight rafters no matter what may be the angles of the building. The bevels, valleys and hips are both found the same way.

Finding the Bevel When Backing a Hip or Grooving a Valley

If it is ever necessary to back a hip or groove a valley, the bevel may be found in a short time no matter what may be the angle of the corner of the building if the method shown in Fig. 1 is followed. Draw the rise of the hip *c-k*, then draw a line at right angles to the plan line *c-e* at any point on that line until it strikes the plate line on each side of the hip as *n-o*. Now with *l* as center and a radius just tangent to the line *c-k* strike the arc as shown. Draw *m-o* and *m-n*, which will be the bevel for backing the hip or grooving the valley, whichever the case may be.

If a roof has two different pitches, the plan line *c-e* will run closer to one plate than the other and the bevel will be different on each side of the hip, but it is found in the same way. Always remember and make *n-o* at right angles to the plan of the hip *c-e*.

One Thing to Rememer When Framing with the Square

There is one thing to remember in framing with the steel square and that is you must always have a right triangle from which to get your figures, to use on the square, as in obtaining the seat and plumb cuts. The run and rise form a right angle and we take the run on either the blade or tongue and the rise on the other; the same way in getting the side bevels for hips, valleys and jacks.

It is often said that the run and length will give the side cut. The reader will doubtless think that run and length lack quite a bit of being a rightangle as shown at *b* of Fig. 1, where *b-e* is the run and *b-g* the length. The reason that the run and length will give the side cut for a square hip roof—and a square roof is the only kind that will do it—is because the run *b-e* in Fig. 1 is the same length as *b-j*.

Cutting the Jack Rafters

In cutting the jacks for *"A"* in Fig. 2 length and run would not do it all because the run *a-e* is not as long as the rightangle line *a-b*, so in getting the side cut for these jacks with the steel square, we must use the length *a-f* or *a-s*, which is the same, and the length of the plate *a-b*. This will give the bevel at *s*. In getting the side cut for the long hip, length and run will not do for the run *b-e* is not the same length as *b-j*, which is the rightangle line. Take the length *b-g* or *b-g'*, which is the same on the tongue and *b-j* on the plate; the tongue will give the bevel at *g'*.

There are all kinds of framing squares, with so many figures on them that one can hardly remember which is which, and then they only give the cuts for the most common roofs. When the building mechanic runs up against something hard he is naturally confused, and does not know what to do. By this I do not mean to condemn the framing squares, for they are all right, but the mechanic should learn how to frame with the regular square first, and then he will know just why so and so give the cuts. The framing square will often help him then to do his work quicker, and if he runs up against something like that shown in Fig. 2 he will know how to go at it. In cutting Fig. 2 he can use the T-bevel or he can measure the lengths of the lines and use the steel square.

Suppose for example we are going to get the side cut for the long hip. Measure from *b* to *g'* and suppose it would be 6½ in.; then measure from *b* to *j* and suppose that to be 5 in.; take 6½ and 5 on the blade and tongue, or 13 and 10 would be better, then take 13 on the blade and 10 on the tongue, and the blade would give the bevel at *g'*, which would fit against the ridge.

The Best Time to Build

The subject indicated by the above title is one that is being much discussed at the present time and occupied a leading place at the recent Milwaukee convention of the National Association of Real Estate Boards. It came up for consideration at the conference on "Financing, Building and Selling Homes," and the following comments by O. E. Hawk, president of the Youngstown Real Estate Board, is of pertinent interest:

"The successful builder must handle the building in its entirety, namely, control his own plumbing, lumber, mill work, electric work, and must be able to finance the building until the buyer has paid in his last dollar. The great questions confronting the builder are four in number:

"1. Is the present a good time to build?

"2. Will general cost be cheaper next year?

"3. Should we provide now for continuous future operation?

"4. Are we fair and intelligent to the buyer when we say to him it will never be cheaper?

"The present is the best time, as we have at all times 200 houses under construction and all are sold far in advance of completion. We finish and sell a house every day in the year.

"As a lumber dealer, manufacturer and lumber producer I say it will never be cheaper, as lumber is scarcer and the hauls are continually getting longer. Enormous amounts of lumber are being shipped abroad and growth of new lumber cannot keep pace with demand.

"The labor question is a great factor at present. The best young men are going to the army. Next April will see a 10 per cent raise to all labor. A great era of prosperity is upon us.

Scale of Wages in the Building Trades

Official Figures Giving Rates of Wages in 20 Important Cities of the United States

IN view of the great increase during the past three years in the cost of practically all materials entering into building operations, it is interesting to note the rates of wages per hour paid at the present time in some of the more important branches of the building trades. By comparing the figures in the table here presented with those given in the issue of the paper for October, 1914, it is possible to observe the changes which have taken place since the European conflict began. Obviously most of these changes are in the direction of increases, some of which are quite marked. In a few cities, however, there are branches of the trade in which no change has been made in the rate of wages, as for example in Chicago there are seven branches in which the

Rates of Wages, per Hour, Paid in Various Branches of the Building Trades

Name of City	Masons and Bricklayers	Structural Iron Setters	Plasterers	Lathers	Plumbers	Steam Fitters	Carpenters	Painters	Sheet Metal Workers	Electrical Workers	Roofers	Cement Finishers	Laborers and Hod Carriers
Albany	70	62½	70	62½	62½	62½	56¼	56¼	60	56¼	60	40	L. 33⅓ H.C. 40
Buffalo	M. 55-60 B.L. 70	65 to 72½	65	60	62½	62½	57½	50	47½	50 to 62½	Comp. 30-42½ Slate 55	60	35
Boston	75	68¾	70	72½ Jan. 1, '18 75	68¾	68¾	65	67½	60	70	55	70	L. 40 H.C. 42½
Hartford	75	68¾	75	62½	62½	62½	62½	65	50	60	68¾	75	L. 37½ H.C. 43¾
New York	M. 62½ B.L. 75	68¾	75	68¾	75	75	68¾	62½	62½	65	Comp. 46⅞ Sl. & Tile 68¾	70	Lab. 37½ Plast. Lab. 43¾
Philadelphia	M. 60 B.L. 70	70	70	62½-70	56¼	56¼	60	45	56¼	40 to 56¼	56¼:50	50-55	Lab. 25 to 37½ H.C. 40-50
Washington	70	70	70	62½ $2.50-3.00	56¼	62½	62½	56¼	56¼	62½	Metal 56¼ Slag 21⅞-43¾	50	Lab. 25-30 H.C. 35
Atlanta	M. 55 B.L. 60	45-62½	55	37½	62½	56¼	50	37½	45	56¼	31¼	43¾	20
Minneapolis	M. 70 B.L. 75	68¾	75	50	68¾	68¾	55	55	50	56¼	50	50	30
Omaha	75	68¾	75	65	75	75	57½	57½	55	60	Grav. 40 to 50 Tile 55-60	62½	Lab. 35-40 H.C. 40
Chicago	75	70	75	71⅞	75	75	70	72½	68¾	75	67½	72½	45
Cincinnati	M. 65 B.L. 75	65	75	62½	65⅝	62½	62½	55	50	62½	40-45-50	55	Lab. 25-30 H.C. 42½
St. Louis	M. 70 B.L. 85	70	81¼ Jan. 1, '18 87½	75	75	75	70	62½	62½	75	60	62½	Lab. 40-50 H.C. 55
Memphis	82½	62½-65½	75	Wood 50 Metal 62½	62½	75	55	55-60	53⅓ up	56¼	22½ to 45	50	Lab. 17½ H.C. 30-37½
New Orleans	62½	62½	62½	35 to 50	56¼	56¼	40-45	37½-40	40 to 45	50	25-30	30-35	Lab. 15 H.C. 28-30
San Antonio, Tex.	M. 62½ B.L. 87½	56¼ to 75	75	62½	75	75	62½	50	50	56¼	50	62½	L. 18⅔ to 25 H.C. 25
Denver	M. 75 B.L. 87½	75	87½	62½	75	75	70 Oct. 1st, 75	62½	62½	62½	62½	75	Lab. 28⅛-40⅝ H.C. 43¾-50
Seattle	87½	62½-75	87½	62½-75	81¼	81¼	70	65	68¾	75	60	68¾	50
Portland, Ore.	75	62½	75-87½	75	75	75	56¼	50	68¾	56¼	50	62½	L. 37½ H.C. 50
San Francisco	87½	75	87½	75	81¼	81¼	68¾	68¾	75	75	Slate tile 62½ Compos. 75	75	Lab. 37½ Hod carriers: Brick 56¼ Plast. 62½

figures of wages are the same as in July, 1914.

The figures covering the twenty cities which we present in the accompanying table are taken from an official compilation of seventy cities in the United States and Canada by E. M. Craig, secretary of the Builders' Association, 808 Chamber of Commerce Building, Chicago, Ill. The figures are revised up to July 1 of the present year.

Of the seventy cities in the official schedule sixty-five are in the United States and five in Canada, the latter being Edmonton, Montreal, Toronto, Vancouver and Winnipeg.

In selecting the twenty cities mentioned in the table we have taken a few along the Atlantic seaboard, a second group extending from north to south through the central portion of the country, while a third group embraces some of the extreme western points ranging from Denver and Salt Lake City to the Pacific Coast.

Trades Operate on Hourly Basis

It will be seen from an inspection of the table that the trades operate under an hourly scale with the exception of the city of Washington, where the lathers are paid by both methods, that is, by the hour or by a stated sum per day.

In addition to the information given in the table, it may be interesting to state that in Philadelphia laborers work eight, nine and ten hours a day; in Salt Lake City the roofers work nine hours and the same is true of roofers and laborers in St. Paul. In Memphis most of the work is done by the "open shop" plan. The roofers and laborers work ten hours a day and the marble cutters and pipe-covering workers, nine hours. In Boston, terrazzo, mosaic-workers and composition floor men receive 70 cents per hour. In Chicago, slate roofers receive 72½ cents per hour.

In Cleveland, plasterers will receive 75 cents per hour on the first of January, 1918, cement finishers' helpers 45 cents and sheet-metal men 70 cents on Oct. 1, and electricians 78⅛ cents on Nov. 1 of the present year. In Providence, R. I., plasterers work forty hours a week.

The Chinese Apartment House

Some very interesting particulars regarding the apartment house as it exists in China were given out a short time ago by Thomas W. Clarke, a construction engineer recently returned from China. Referring to a photograph which he had, he stated that the apartment house shown was more than 400 years old and housed about 400 families.

"It is the chief building of a village in the southern end of the Fu-Ken Province, South China, about 300 miles from Hong Kong. Built in a perfect circle, it is five stories high and is massively constructed of stone and brick. Its design shows that it was built as much for protection as for dwelling purposes. There are no windows on the outside, and enemies would have to scale the walls before they could harm those within. There is only one entrance, a very strong gate, capable of standing siege for a long time unless attacked with modern weapons. Undoubtedly the house was built to withstand the pirates and roving bands of robbers that terrorized Fu-Ken Province in the old days.

"The outside wall is about 50 ft. high and about 550 ft. in diameter. The interior court is 400 ft. across, paved with great stone blocks. Right in the center of the yard is the communal water supply, a large cistern which is fed by the water from the roof running through terra-cotta drains.

"There are no modern conveniences, and the various tenants reach their dwellings by way of bamboo ladders.

"The apartments are 12 ft. wide, and the floors are made of rough-hewn lumber laid over poles of Chinese fir.

"The roof is made of heavy terra-cotta tiles laid so that the edges overlap, and it is weatherproof. Furthermore, the tiles afford perfect shelter from the sun, which is hot in South China, and the top-floor apartments are as cool as those lower down. The whole structure is weatherproof.

"Every apartment has its own veranda. These run around the whole interior of the house and face on the courtyard, which often serves as a market place when merchants are allowed to come in from near-by villages. The courtyard is also the meeting place of all the residents of the apartment house, and there everything of interest to the community is discussed.

"The four hundred families include considerably more than 1000 persons, and they have a government of their own. It is not unlike the much advertised form of commission government adopted in some of the towns and cities in this country.

Cement Industry for Six Months

The first half of 1917 has been a period of great activity in the Portland cement industry. Production and shipments from practically all mills have considerably exceeded those for the corresponding period of 1916, according to E. F. Burchard of the United States Geological Survey, Department of the Interior, and prices are now higher than they have been for 19 years. The present strong demand for cement is reported to come principally from small consumers, many of whom are in agricultural districts, although much cement is going into roads and pavements.

Whether or not the output for 1917 will break the previous high record—that of 1913—cannot now be predicted. The month of June has shown a slight abatement of demand from small consumers in certain districts, attributable in part to the entry of the United States into the war, to the prospect of increased taxation, and to the purchase of Liberty bonds. General building and improvement work is likely to be curtailed or postponed at times of high prices and uncertain deliveries. It is possible that there may be increased demand for cement for military uses, but any increased demand is likely to be local rather than general.



Attractive Show-Window Backgrounds Can Be Made with Wall-Board

Utilizing Wall Board in the Store

A Few Practical Suggestions of Value to the Carpenter and the Builder

By Joseph A. Poesl

MANY varied and appropriate uses for wall board are to be found in every kind of store. Nevertheless, there are carpenters and builders who seem to have the impression that its field of usefulness lies solely within the narrow confines of the home or residence. Of course this is far from the actual fact, for it can be seen in many stores of every description, and fulfilling the purpose of its existence under different guises.

Evidently the show window is where it was first used in the store. Here it has enjoyed a large demand ever since the early days of the wall-board industry. To the numerous needs of the show window which it fills must be attributed



Interior of a Fine Looking Hardware Store Which Is Finished with Wall Board

this success. It is utilized not only for backgrounds, partitions and the like, but also for display forms and other accessories of window trim.

But the real reasons for its popularity are due to its more or less well-known qualities of cleanliness and ease of handling. Another factor is that it takes decoration nicely, either in water or oil paints. When a storekeeper considers the use of wall board for his windows he can feel assured that his merchandise will not be soiled or damaged by it as a result.

Making a Permanent Window Background

A permanent window background of wall board is made by nailing it to a framework constructed of 2 by 2 in. studs. The important point to look after here is the rigidity of the framing, which is often brought about by placing a dressed 2 by 4 flatwise on the top to form the finishing cap as well as the header. In order that the reverse side may present a pleasing appearance also, it is advisable to use dressed lumber only. Special care should be exercised in spacing the studs symmetrically to permit the reverse side to be decorated to harmonize with that of the store proper. These remarks are made with the presumption that the wall board is applied to but one side of the studs—the customary method—otherwise there would be no object in using dressed lumber for the concealed parts.

The Frame Work

A comparatively late but already common practice in the erection of show window backgrounds is to make the framework permanent with the panels of wall board removable. The way this is done is with rabbeted stiles and rails instead of regular decorative strips, much after the manner of constructing doors. These stiles and rails also do away with the studs. Therefore, one of the finer woods is selected, and no stile or rail made less than $\frac{7}{8}$ by $2\frac{3}{4}$ in. in size after being dressed. As in the ordinary construction, a heavier member is placed on the top to insure rigidity. When the framing is completed panels of wall board are inserted in the openings and held in place securely by small appropriate moldings.

Why Such a Window Background Is Desirable

Such a window background as just described is particularly desirable by storekeepers that change their windows according to the season, the day or the weather. It enables them to make rapid and frequent changes of the panels, each practically resulting in a new and different background. Of course the frequency of these changes depends entirely upon the number of complete sets of similarly decorated panels they have on hand. These panels, by the way, are always decorated on both sides, as, obviously, they are exposed on the back to the inside of the store.

When it is desired to divide show windows into two or more parts, portable partitions are employed for the purpose. Sometimes these are simply low and small devices, but they are also seen in the form of folding screens. The former are small frames, very much like picture frames, having wooden legs fastened to the bottom to keep them in an upright position. The screens are constructed of rabbeted vertical pieces and cross-pieces with removable panels, each screen generally consisting of three narrow and tall frames held together with double-acting hinges.

Rooms Built of Wall Board in the Show Window

In the cities and larger towns progressive furniture dealers build rooms finished with wall board right in their show windows for the display of furniture in surroundings as much like those in the average home as possible. Undoubtedly those features of wall board, cleanliness and ease of handling, here, again, played an important part in influencing these merchants in their choice.

The construction of display rooms, in show windows or stores, and demonstration rooms for phonographs is the same in each case. The studding consists of either 2 by 3's or 2 by 4's, and the ceiling joists of 2 by 6's when there is no load to carry. It is very essential that all this rough lumber be sized. Thereby straight and plumb wall surfaces and level ceiling surfaces are readily obtained. Wall board is put on both the inside and outside of the partitions, but only on the bottom side of the joists. The application and decoration are no different from those followed in regular wall board work.

Some Interesting Examples

One of the photographic illustrations accompanying this article is evidence of the expense a merchant will incur in order to display his wares to the very best advantage. It shows a display room within a large furniture store. There can be no question but that it is a fine-looking room, and it indicates pretty well what can be done with wall board. It will be noted that the decorative strips and other trim in the room match and harmonize with the furniture and mantel in display. While it is not definitely known that this trim is not permanently fixed to the walls, very likely it can be quickly removed and replaced by other trim of different styles to go with other styles of furniture. In this event, no doubt, round-headed brass screws are used to hold it in place. The scheme of having removable trim is more common than one would suppose. In that way a merchant makes his show rooms bring him a maximum return for his investment.

Using Wall Board for Booths

It has already been casually mentioned that phonograph demonstration rooms or booths are being treated with wall board. Mainly, this is because of its favorable acoustic qualities. However, the fact that it also permits of pleasing decoration is another point in its favor, for it is almost as important that these rooms be attractive as well as soundproof.

To produce extremely sound tight phonograph demonstration rooms three thicknesses of wall board are put in the walls or partitions. One is placed on the outside, one in the middle and another on the inside. Instead of using solid 2 by 4 studs, two 2 by 2's are substituted for each one of them; plainly this is necessary to get the one thickness in the middle. The procedure is this: first a series of 2 by 2 studs is erected, care being taken to place a full 2 by 4 at the top and bottom for the header and shoe respectively. The wall board is now applied to both sides of the 2 by 2's. Then another series of 2 by 2's is erected, each stud being nailed directly to one of the first put up. On the outside of this last series another thickness of wall board is applied. The rest is the same as in regular work. The board in between need not be decorated in any way.

Wall board can be nailed to light wooden frames to make such show window accessories as box columns and rectangular and cylindrical display forms. Decorative strips of wood are not needed when this is done. The whole form may be covered with a plain wall paper to suit the purpose in mind. Ordinary paper-hanger's paste will hold the wall paper to the wall board. In bending wall board to cylindrical shapes one end should first be secured to the round frame of wood and the board gradually and slowly bent to the required shape.

An example of an unusually attractive store finished with wall board is shown in another of the illustrations. The clever treament of the columns and the beams is a feature worthy of special notice. Also of interest is the harmonious panel arrangement. By alternating with a circular and square shaped panel on the ceiling, monotony has been avoided.

The uses of wall board in the store that have been enumerated do not by any means cover them all. They have been mentioned to give the carpenter and builder a glimpse of the possibilities for profitable work in this particular field opened to them by wall board. It surely ought to make a fertile field for work in the winter, or at other times when things are moving slow in the building world.



A Furniture Display Room in a Store Where Wall Board Has Been Used with Good Effect

"The Seasoning of Wood" is the title of Bulletin No. 552 which has just been sent out by the United States Department of Agriculture. The matter has been prepared by Harold S. Betts in charge of the office of Industrial Investigation and an idea of the scope of the bulletin may be gathered from the table of contents. Attention is first given to the importance of proper seasoning methods and an enumeration and explanation of the many ways in which wood may be injured in seasoning. Reference is made to air seasoning, also to kiln-drying, the types of kilns, the preliminary treatment, and the process of drying. Not the least interesting and valuable of the contents are the rules for piling lumber.



Glimpse of a Few of the Barracks Under Construction Near Louisville. In Front of the Cornfield and at the Extreme Right Is Seen the Path of the Temporary Water Main

Building War Cities for the Army

Details of a Gigantic Undertaking Which Will Appeal to the Practical Builder

IT has been said that a very appreciable percentage of the new building construction work now in progress is not embraced in the published reports of operations as represented by the figures given out by the building departments of the various cities of the country and that the latter are not therefore a true index of existing conditions in the building world. This is undoubtedly true to a large extent owing to the fact that an immense amount of construction work is being done outside city limits to meet the requirements of the United States Government in the way of numerous camps for the great army that is being organized to assist our European allies in the unparalleled struggle for democracy and for the permanent and lasting peace of the world.

Much of this work is embraced in the construction of the sixteen camps or cantonments located at different points throughout the country, there being one each in the States of Massachusetts, New York, New Jersey, Maryland, Virginia, South Carolina, Georgia, Kentucky, Ohio, Michigan, Illinois, Arkansas, Iowa, Kansas, Texas and Washington. Each cantonment comprises from 1200 to 1500 unpainted



A Nearer View Showing More in Detail Some of the Work Under Construction at the Cantonment Near Louisville



View of Section No. 1 Showing Administration Building Used During the Work of Construction as Headquarters for the Contractors and Army Officers Engaged in Building the Cantonment at Louisville

frame structures of the simplest possible character.

The barracks for the men are two-story buildings, 43 ft. wide and of different lengths, depending upon the number of men to be accommodated. The floor plan, which is presented in connection herewith, is that of a building 71 ft. long, and at one end is a single-story kitchen with a pantry and a sleeping room for the cooks. A long counter separates the kitchen from the mess hall, where all of the men living in the barracks will eat. In the center of the first floor is a company hall, with doors leading outside at each end of the structure and a stairway to the floor above. This company hall separates the mess hall from the two first-floor dormitories. The first story is 9 ft. in the clear. On the second floor are four dormitories arranged similar to those on the first floor. The dormitories are separated by partitions so that the men in each are comparatively isolated from the others, which is considered desirable by the Army and Medical Department.

There is a ventilating opening running the length of the ridge of the building to which vertical vent ducts extend from the floor below. Each building has a large amount of window area and the sash can be slid into a pocket to one side to secure ventilation. The lavatories for both officers and men are small detached buildings, the details of a typical lavatory for a comparatively small number of men being presented on another page of this article.

The officers' barracks vary considerably in size and shape. Some are long single-story buildings with a kitchen at one end, adjoining which is a mess room, and then a long hall down the center with rooms measuring 10 ft. 6 in. x 8 ft. 4 in. opening from it on either side and an office at the further end. Other barracks are small single-story buildings with a kitchen, mess room and two to four individual rooms, the largest about 10 ft. square. Other buildings are two stories high with larger rooms shared by two officers; also an office, mess room and kitchen. A few of the officers' barracks have no kitchen and mess room.

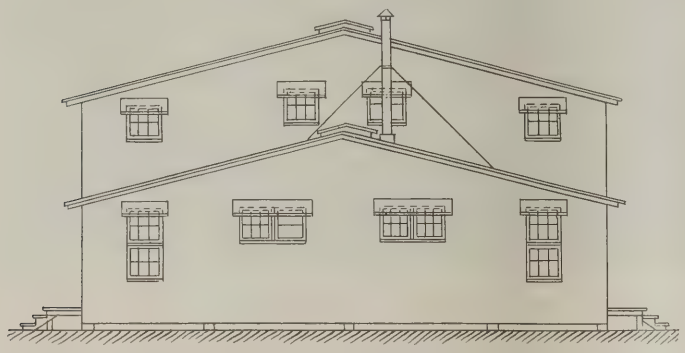
An idea of the construction of the two-story barracks may be obtained from the details which are presented herewith. The framework consists of 2 x 8 in. first floor joists placed 2 ft. on centers; 2 x 4 in. studs; 2 x 4 in. knee braces placed 10 ft.



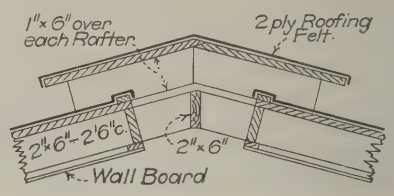
Some of the Buildings Under Construction Just Off the Driveway Leading to the City of Louisville

on centers; 2 x 6 in. ledger boards and 2 x 6 in. rafters placed 2 ft. 6 in. on centers. The outside walls are covered with one-ply roofing felt, over which in turn is placed novelty siding.

The rafters are covered with 7/8 in. sheathing board over which is placed a two-ply roofing felt. they are lapped 4 in. The inside posts are 4 x 4 in. and the braces used are 2 x 4 in. Building paper is placed between all double floors and the joists are doubled under end walls and cross partitions. The center of all spans is bridged with 2 x 8 in. pieces cut in between the joists.



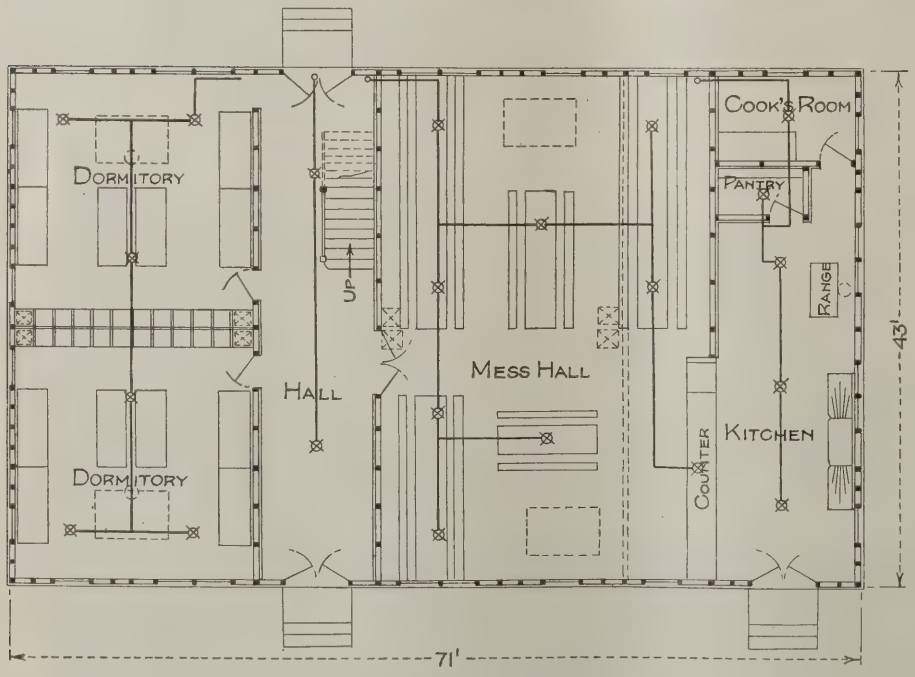
End Elevation of Two-Story Barracks—Scale 1/16 in. to the foot



Cross Section of Vent Ridge—Scale 3/8 in. to the Foot

Front Elevation of Two-Story Barracks With One-Story Kitchen Extension Shown at the Right — Scale 1/16 in. to the Foot





A Typical Floor Plan of One of the Two-Story Buildings for the Men—The Position of the Mess Hall, Dormitories and Kitchen Are Clearly Indicated—Scale 1/16 in. to the Foot

Typical Plan, Elevations and Detail of a Barracks Building at the Army Cantonments

The underside of the rafters is furred and covered with wallboard except in the kitchen.

The girders are made up of two pieces of 2 x 8 in. timber, and where the floor joists rest upon them

The inside finish of the rooms consists of dressed boards put on horizontally and covering the space from the floor to the sill of the upper sash, above which wallboard is used.

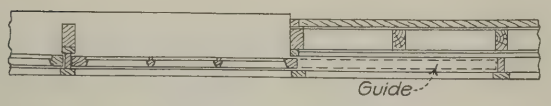
All outside doors are 2 ft. 8 in. x 6 ft. 8 in. and are 1⅜ in. thick.

The buildings rest on 6 x 6 square wooden posts or 6 in. or 8 in. round wooden posts, as may be most convenient.

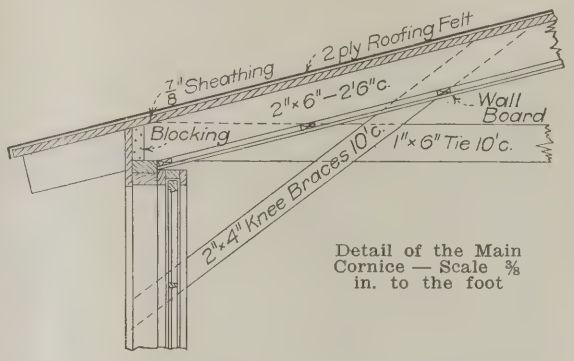
In the way of plumbing fixtures the details presented on another page afford a very comprehensive idea. The lavatory troughs are No. 26 gage galvanized iron, and in order to obtain the proper fall the 1 x 3 in. support is graded at the back ⅛ in. to the foot. These troughs are of various lengths and are provided with the necessary wastes with brass plugs, beehive strainer, gaskets, etc. The urinal troughs are of the same material, the troughs being approximately 6 ft. long.

The shower outfit consists of a 4 in. rough cast brass shower head with removable face and two rough brass compression angle valves. Hot and cold water is supplied by a Domestic Tank Heater.

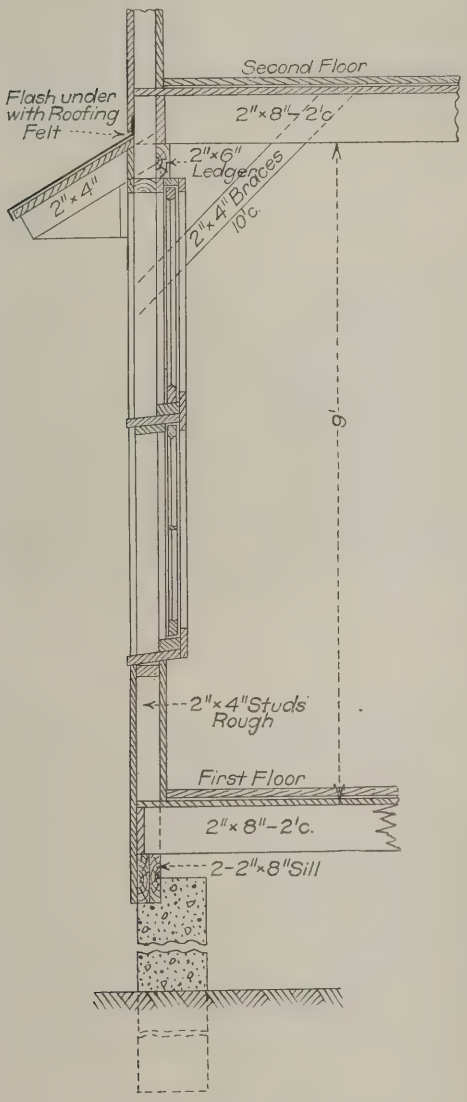
The water closet outfit consists of vitreous siphon washdown bowl and hardwood seat without cover, finished with one coat and shellac and two coats of



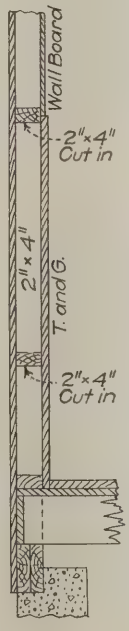
Horizontal Section of Window, Showing the Pocket Into Which It Slides



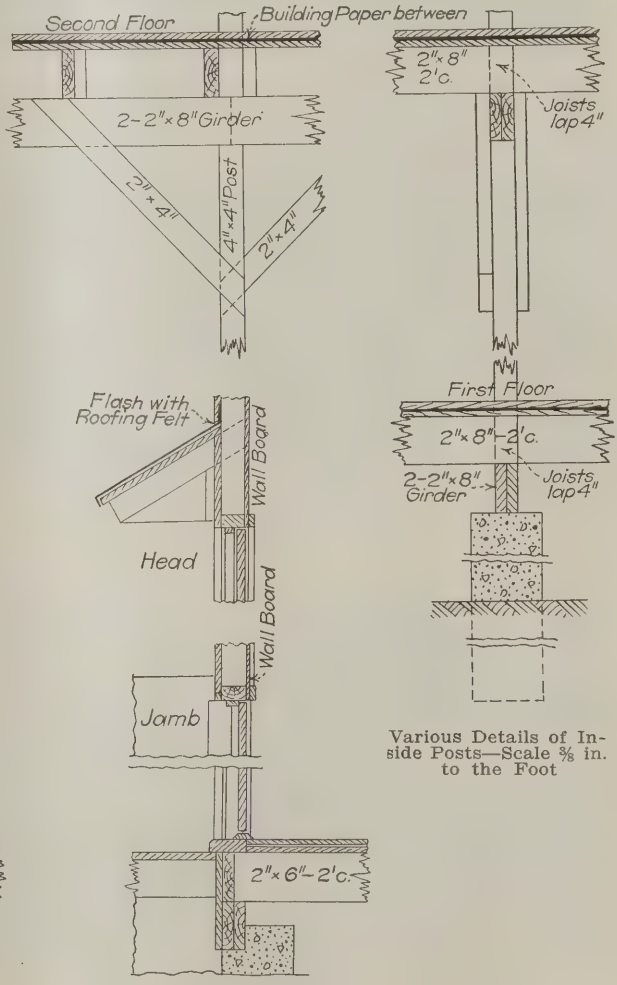
Detail of the Main Cornice — Scale ⅜ in. to the foot



Vertical Section of Main Wall Taken Through the Windows and Cornice



Detail of Outside Wall Taken on a Vertical Line Between the Windows



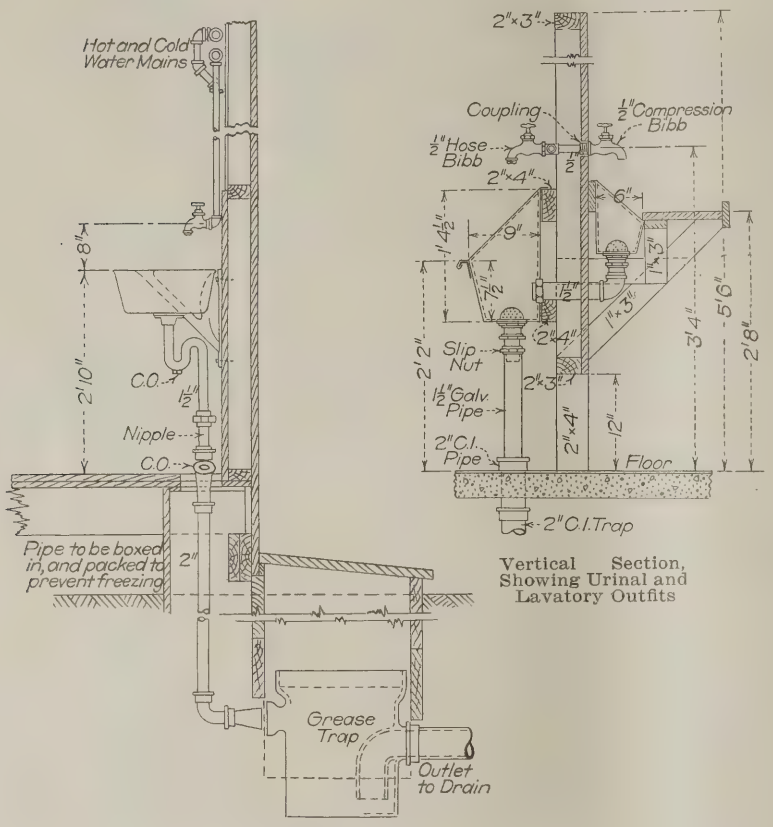
Detail of the Outside Doors—Scale ⅜ in. to the Foot

Various Details of Inside Posts—Scale ⅜ in. to the Foot

Miscellaneous Constructive Details of a Two Story Barracks Building

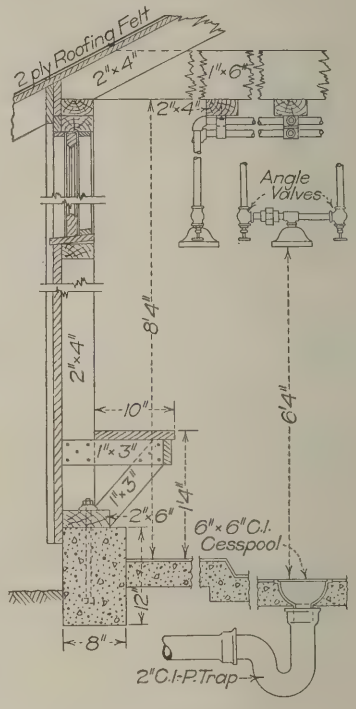
varnish; vitreous china or enamelled inside and out cast-iron tank, ball cocks with float and necessary fittings. All floors of the lavatory buildings are of cement sloping toward floor drains at various points and are connected with sewer lines. In the kitchen is a 20 x 40 galvanized sink supported by means of brackets and having drain and splash boards.

One of the largest cantonments is that at Wrightstown, N. J., and known as Camp Dix. It will consist when finished of 693 buildings, to be used as barracks and quarters, 400 stables and sheds, 60 buildings for the remount station and 60 for the base hospital—a total of 1213. For this work, 30,000,000 board feet of lumber of all description is required, 700,000 board feet of milled lumber, 9,500,000 sq. ft. of roofing paper and tarred felt, 2,500,000 sq. ft. of wallboard, 51,000 wood sash, 8000 wood doors, 11,000 pieces of plumbing fixtures, 100 miles of exterior electric wiring, 28 miles of water main, three 200,000 gal. wood tanks and one 200,000 gal. steel tank. The area

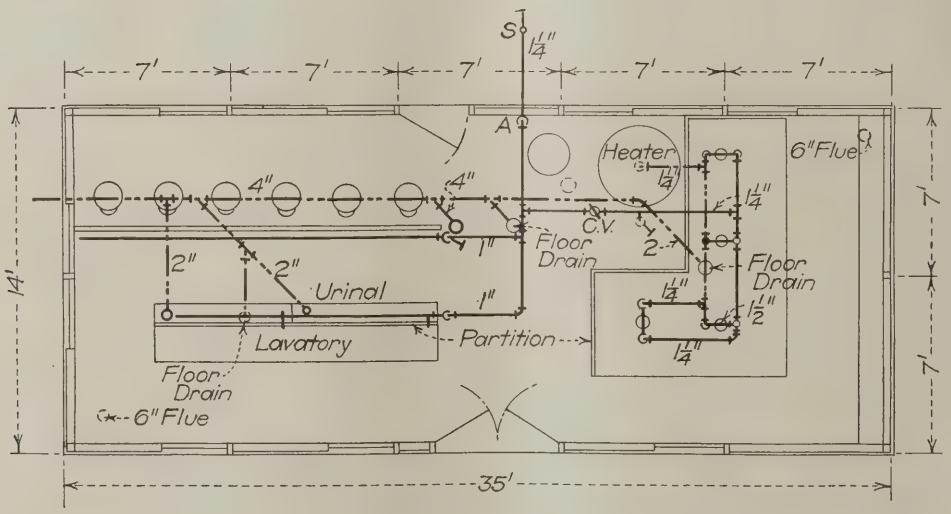


Vertical Section, Showing Sink and Watercloset Outfits

Vertical Section, Showing Urinal and Lavatory Outfits



Vertical Section, Showing "Shower" Outfit



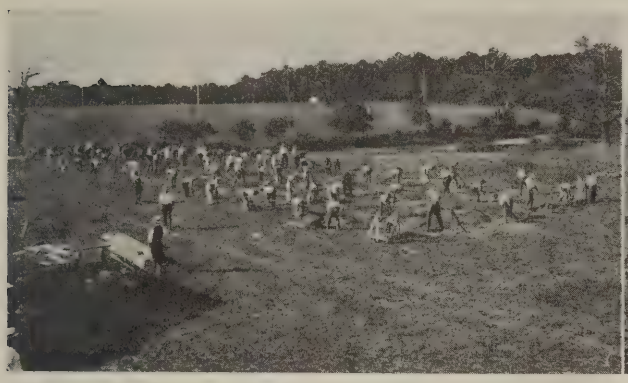
Plan of Lavatory Building to Accommodate from 61 to 80 Men—Scale 1/8 in. to the Foot

Miscellaneous Details of the Plumbing at the Army Cantonments

of ground covered by the main cantonment is 9000 acres, or approximately 14 sq. miles. Running through the center will be the parade ground 1000 ft. wide.

Here the company barracks range all the way from 20 x 35 ft. in plan to 43 x 140 ft. while the officers' quarters range from 20 x 21 ft. in size to 20 x 122½ ft.

In the progress pictures presented on this page we show the operations in the construction of a barracks building at this camp or cantonment. An idea of the rapidity with which the work was accomplished may be gleaned from the fact that a 200-men barracks was erected within one workday of ten hours. Engineers entered the field and located the site early in the morning, after which carpenters erected batter boards and lines. Laborers then appeared with shovels and dug the foundation post holes. They were followed by the carpenters who set the posts and cut them off at the proper elevation. Girders and sills were then placed on the posts, after which the joists for the first floor were unloaded in the proper position directly from the wagon. While the joists were being set, the framing for the side and end walls was unloaded and put together ready to be raised, each side a



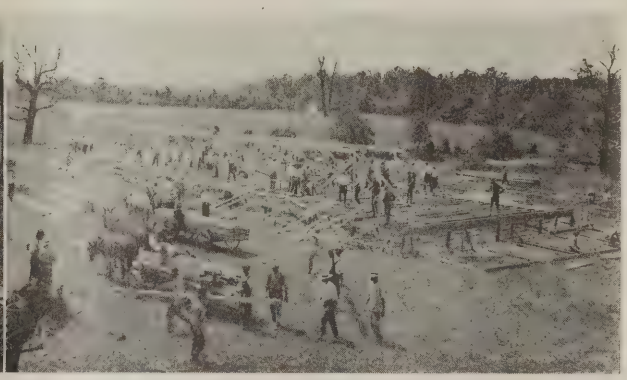
No. 1—Digging the Holes for the Foundation Posts



No. 2—Cutting Off the Foundation Posts



No. 3—Setting the Sills and Girders



No. 4—Setting the First Floor Posts and Second Floor Girders



No. 5—Setting the Second Floor Joists



No. 6—Enclosing the Frame with Felt and Siding

Pictures Showing Different Stages of Work on a 200-Men Barracks Building at Camp Dix, Wrightstown, N. J., and Completed in Ten Hours

completed unit. All framing was cut at the framing yards, delivered ready to erect without additional fittings as is customary in steel buildings. After this operation was finished, the second floor joists were delivered and placed in position, and carpenters began covering the exterior walls with siding, which had previously been cut to fit.

The floor was laid at the second story and columns erected carrying purlins and ridge poles while the work of siding was in progress. The rafters were set and the roofs completed by the time the siding reached the eaves.

The necessary number of ventilators were made up in units at the yard and set in place before being covered with paper. Hoods for the windows were finished complete with paper before erection.

The Heating Systems to Be Used

The heating of the men's barracks and all lavatories will be with pipeless furnaces or cannon stoves. All officers' quarters, medical buildings, generals' residence and headquarters, administrative and telephone buildings and bakery will be heated by separate gravity return steam systems built in a projection from the buildings. Radiation will be direct-column cast-iron hung on the walls. Every building is to be electrically lighted.

At the cantonment near Louisville, various views of which are presented herewith, one of the Administration buildings is said to have been built partly of lumber cut from a Mississippi pine forest less than a week before. The trees were felled and went through the mills Saturday, were kiln dried Sunday, loaded Monday on special cars commandeered by the Government, rushed to Louisville at almost passenger schedule time, and when the carpenters at Camp Taylor—the name of the cantonment—laid down their tools at the end of work the following Saturday, men were moving desks and other office paraphernalia into a house which had been part of the forest six days previously.

Amount of Southern Pine Used

At the Louisville cantonment, which is now practically completed, from 50 to 70 carloads of Southern yellow pine were consumed daily in the building operation. The major portion of this lumber was furnished the Government under a special arrangement made with the Southern Pine Emergency Bureau—a war organization with operating headquarters in New Orleans which represents the entire yellow pine industry as distributing agency in handling Government business. Through the efforts of the bureau, the Government was enabled to obtain in quick time and at reasonable prices much of the lumber now being used in cantonment construction at various points in the country. The bureau by means of stock sheets showing lumber on hand at various mills in many parts of the South was able to place orders nearest the points of destination, thus insuring prompt deliveries and short hauls with a minimum of freight charges.

In the case of the Louisville cantonment, for instance, most of the order was given to Alabama, Mississippi and Florida mills. When the Little Rock, Ark., cantonment order was filled, it was placed with the Arkansas mills. Other cantonments provided for by the bureau include those in Ohio, Iowa, Texas and Kansas. Through this cooperative work of the mobilized resources of the Southern pine industry, it was possible for the War Department, in spite of the great demands made on the lumber trade, to be assured of an adequate supply of properly graded and standardized materials and thus greatly facilitated the construction of the sixteen war cities as well as the general barracks camps elsewhere.

The cantonments are laid out in groups of buildings each called a unit or section, the general design having been prepared by Harlan P. Kelsey of "City Beautiful" fame, who is one of the experts called on by the War Department to aid the Government in the present emergency. Provision is being made at each cantonment to take care of anywhere between 35,000 and 40,000 troops.

Each cantonment will be virtually a city in itself, with streets, blocks, stores, electric lights, railroad yards, water lines, garbage incinerators, etc., in addition to the hundreds of buildings required. It is stated that each cantonment will require about 4000 carloads of material, assuming that all of it must be brought to the site by rail.

The following is a list of the cantonments with the designated division, location and contractors:

FIRST DIVISION—Ayer, Mass. General contractors, Fred T. Loy & Company, Springfield, Mass.

SECOND DIVISION—Yaphank, L. I. General contractor, Thompson Starrett Company, 51 Wall Street, New York.

THIRD DIVISION—Wrightstown, N. J. General contractor, Irwin & Leighton, Philadelphia, Pa. Will install all mechanical systems with own forces.

FOURTH DIVISION—Annapolis Junction, Md. General contractor, Smith, Hanson & MacIsaac, 18 East Forty-first Street, New York.

FIFTH DIVISION—Petersburg, Va. General contractor, Rhinehart & Dennis Company, Charlottesville, Va. Sub-contracts to W. H. Harrison & Co. & Thomas.

SIXTH DIVISION—Columbia, S. C. General contractor, Hardaway Construction Company, Columbus, Ga.

SEVENTH DIVISION—Atlanta, Ga. General contractor, Arthur W. Tufts Company, Atlanta, Ga. Subcontracts to Farrell Heating & Plumbing Company and sheet metal to Dowman-Dozier Mfg. Company, Atlanta.

EIGHTH DIVISION—Chillicothe, Ohio. General contractor, A. Bentley & Sons Company.

NINTH DIVISION—Louisville, Ky. General contractor, Mason & Hanger, Richmond, Ky.

TENTH DIVISION—Battle Creek, Mich. General contractor, Porter Brothers, Detroit, Mich.

ELEVENTH DIVISION—Rockford, Ill. General contractor, Bates & Rodgers Construction Company, Chicago, Ill.

TWELFTH DIVISION—Little Rock, Ark. General contractor, James Stewart & Company, New York and St. Louis. Handling all work direct.

THIRTEENTH DIVISION—Des Moines, Iowa. General contractor, Weiz's Sons, Des Moines, Iowa.

FOURTEENTH DIVISION—Fort Riley, Kan. General contractor, George A. Fuller Company, New York, N. Y.

FIFTEENTH DIVISION—Fort Sam Houston, Tex. General contractor, Stone & Webster, Boston, Mass. Not subletting any of the work.

SIXTEENTH DIVISION—American Lake, Wash. Contractor, Hurley Mason & Company, Tacoma, Wash.

Some Echoes of the Noon Hour—II

Further Discussion by the Carpenter-Foreman and His Men—Building Fences

By Edward H. Crussell

"WHAT I can't understand," said Bliss, as he snapped a rubber band round his folded lunch box, "is what you've all been doing since I've been gone. Haven't any of you been sick have you? Just shows what a difference a good man makes in a gang; here I've been away best part of a week and I'll bet I could eat all you've done since I've been gone."

"I'll bet he could too," said the kid. "Did you see what he put away for lunch? No wonder there's talk of a food shortage."

Bliss looked around for something to throw at the speaker, and not finding anything handy, decided to treat the remark with the contempt it deserved.

"What have you been doing all this time you've been away?" asked "Old George." "I know it must have been something important, otherwise the boss never would have sanctioned the idea of breaking up the gang by taking your valuable presence out of it."



Fig. 4—The Foreman's Fence

George said this just as if he and the others didn't know that the "important work" had been the building of a back fence, and a general laugh was the consequence; followed by a one-sided argument as to whether the boss had taken the only man he could trust, or the man who could most easily be spared.

"Anyway," said Bliss, "it was a position of trust,

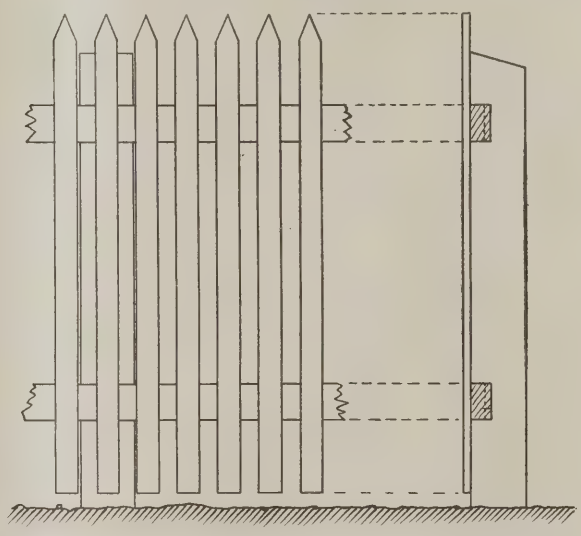


Fig. 5—Detail of Scotty's Picket Fence. Posts Are 8 Ft. on Centers and the Pickets 2 In. Apart

and I had one man under me—the fellow who dug the post holes. I know what a foreman's worries are now, and I don't wonder they are all either gray-haired or bald-headed. This duck that I'm speaking of added years to my age. He had contracted with the boss to do the digging at twenty-five cents a hole. They were to be 4 ft. deep and his method of measurement was to stick the rod over in one corner of the hole at the bottom, let it lay over to the other diagonal corner at the top, and then say, 'Four f'it good enough.' He used a pick and shovel for the digging, and I had to bring him back an average of three times for every hole. Each time he'd splutter and cuss in garlic till all was blue."

"Garlic?" queried Scotty, "you mean Gaelic, don't you?"

"Do I?" was the reply, "I don't know. I thought it was garlic. I'm not very well posted on these foreign perfumes."

"My mistake," acknowledged Scotty with a grin, "go on with the plea for the defense."

"Well," continued Bliss, "this fellow was not so foolish as he might have been. Because of his equipment, he had to dig his holes somewhat in the

form of a trench and in two or three places where the posts came close together, like for instance in the gateways, he took advantage of this and made one hole serve for two posts by planting a post at each end of it."

"Yes," commenced "Old George" with fine irony, "that certainly was bright of him to think of a thing like that——

Building the Foreman's Fence

"Oh, I don't know," broke in the foreman, who had joined the group a few minutes before; "some of these obvious things are the hardest to see. I remember some years ago being at work on a fence for a cattle corral; the ground was a cemented gravel, full of large boulders and we had been fooling around the job a couple of days before someone thought to do the digging in the form of a trench. When I say full of boulders, I mean just that, it's no uncommon thing in those parts to get enough boulders out of the excavation for the cellar to build the lower walls of the house. It is something calculated upon and the masons have become quite expert in building this style of wall. They crack the large boulders into four, turn their flat sides outward and fill in the spaces with the smaller stones.

"Say, kid, run and get that old pocketbook out of my tool box, will you? I think there's a photo in there that'll give some idea of what the job was like."

The Picture of the Fence

The "kid" returned in a few moments with the pocketbook, and Fig. 4 was sorted out from amongst its contents.

"As I look at them now," said the foreman, "the boulders don't seem to be quite so big as they did when I was helping to lift them out of the trench, but I think you'll all agree that to dig post holes, 4 ft. apart and 4 ft. deep, in such ground as that would be interesting to say the least."

"I remember a job of fence building I had charge of some years ago," said Scotty, who had been busy for the last few minutes with his pencil and a piece of sheathing, "and I very nearly came a cropper on it, too. It was a picket fence and the drawing supplied by the architect looked something like this," and he showed the sketch, Fig. 5.

Scotty's Fence

"There was over 2000 ft. of this fence to be built at each end of a long steel bridge. I had charge of the work at one end and an old-timer had charge at the other. I was some younger then than I am now but at that time thought I knew a whole lot more, and was rather upset (though not outwardly so) when I found that the old-timer was carefully spacing all his posts as he set them, in order that the pickets might space evenly and work out so as to come in the center of the posts and cover the joints as the drawing shows.

"You see, in my hurry to get ahead of the other fellow, I had overlooked this little matter, had set my posts fairly close to measurement (but not accurately so) and was intending to space my pickets 2 in. apart and let them come where they would. I was just about ready to put on the pickets when I got next to myself and seeing that something had to be done I evolved the following scheme:

"I marked off a rod, showing the pickets with the proper spacing, as they were on the drawing, and then, by testing each panel with the rod, I was able to tell how much to shorten or lengthen the spaces so as to make the pickets come out even. The scheme worked well and I was able to prove that my method was faster than the old-timer's—that is, setting the posts carelessly and spacing the pickets afterward was a faster method than setting the posts with sufficient care to avoid this latter spacing.

How We Built It

"I had a somewhat larger gang than the one of which Bliss is so proud, and I remember how we followed each other along that fence, one man nailing the post pickets, two more testing and spacing off, another placing the pickets and driving the top nail, and another following along behind driving the remaining nails. This last man was a laborer, a big husky Scandinavian, who had had a lot to say about what an easy job a carpenter's was. He did horizontal nailing on this fence all one day, and the next day couldn't use his right hand; it took some time to convince him that the reason was, because of the little 8d nails he had driven the day before. A lot of men could discover new sets of muscles by working steadily at some of the easy things a carpenter does."

"Say, chief," said Bliss, who had been examining the photo, "how long is it since you took this picture?"

"I can't say exactly," was the reply, "seven or eight years. Why do you want to know?"

The Picture Criticised

"Oh, no particular reason, only from what I know of you and from what you say about helping to lift boulders out of a trench, I take it that you were in a subordinate position at that time and I was just wondering how long it would be before I could expect to be a foreman. I did my post hole work last week."

No one made the obvious rejoinder, and after a slight pause, Bliss continued. "There's one little thing I wanted to tell you about. One of the tenants where I built that fence was a music teacher. He begged some scraps of wood off the boss and wanted me to show him how to make a garden seat. I remembered what Scotty was telling us the other day about his landlord. I also remembered that my little girl is taking music lessons, and that thus far I haven't been able to get anyone to 'show her how' for nothing; so I told Mr. Teacher that I would make the bench for him for fifty cents, or teach him how to make it for half a dollar. After he had recovered his breath, he gave me the fifty cents and I made the bench."

The Fence a "Prize Winner"

"It must have been a prize winner," said Shorty, "made out of scrap fence lumber for a fee of fifty

cents. What did you make at it, ten cents an hour?"

"Where I do my own designing," explained Bliss loftily, "my regular charge is $1 per hour. I made Mr. Teacher a seat, 6 ft. long, with arms and a back to it, and finished the job in a little over twenty minutes. I'm no camera fiend and can't show you a photo of it, but I knew some of you doubting Thomases wouldn't believe me, so I made a sketch of it and here it is," shown in Fig. 6.

"By golly Bliss," said Old George, "you'll be a foreman yet there's never a doubt of it, always supposing of course that the hangman doesn't get you first."

"Yes," agreed Bliss complacently, "I flatter myself there's some class to that design."

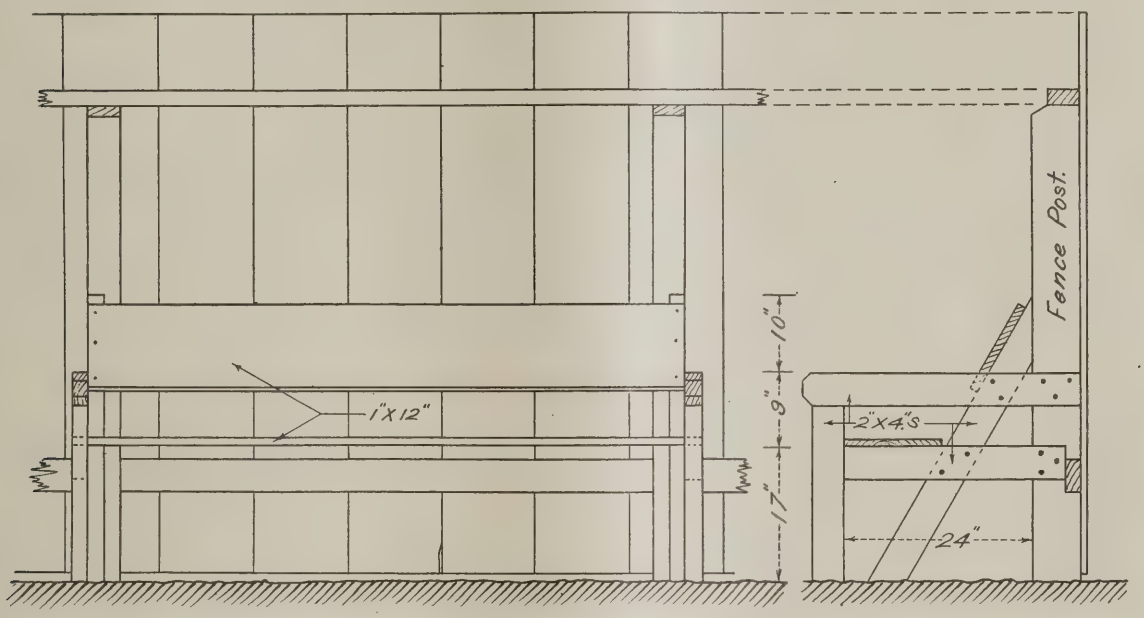


Fig. 6—Front and End Views of the Seat Made by "Bliss"—Scale ½ In. to the Foot

"Class to the design," growled the other, "I wasn't thinking of the design, I was referring to your nerve; anyone who would charge, even a lawyer, fifty cents for building a thing like that, ought to be either a foreman or in jail."

Bliss took one last puff at his pipe and then (as the whistle blew) knocked the ashes out of it." "Jealousy, jealousy!" he explained to the others.

(To be continued)

English Door-Hardware

A writer in one of our English exchanges discusses the matter of what he designates as Metal Door Fittings in a way likely to prove interesting to American readers and we therefore present the following extracts:

The various appliances for opening and closing doors and windows, securing them from intrusion, and fastening them in their places, all have to be fixed by the carpenter, and are usually known as joiners' ironmongery.

Hinges are made of brass, or of wrought-iron or cast-iron. Brass is used solely for the sake of its appearance; it is a bad material, on account both of its softness and of its tendency to corrode.

Probably the best kind of hinge is formed of cast-iron with steel pins. It is mistaken economy to use very narrow hinges. The leverage on the screws is materially reduced by using wide hinges, and the additional cost is not worth considering.

Swing-doors are usually hung with a special contrivance at the bottom. The door fits into a metal shoe, which works on a pivot. This pivot is regulated by a spring, which is fixed under a brass plate flush with the floor. These are expensive goods, but when well made and properly fixed they will last for years. About the best kind of hinge for a door that is intended to be self-closing is that known as a "rising butt." The part which is fixed to the door has a spiral action in an upward direction when opening, and thus the additional advantage is gained of a slight rise in the door, by which it is enabled to clear the carpet when opening, and is closer to the floor when shut.

Cross-garnet hinges are used for the smaller kinds of outhouse doors; and strap hinges, with hook and ride action, for larger doors and gates.

Many varieties of screws and nails are used in fixing joinery. It would be impossible here to enumerate them all, nor would it serve the present purpose to do so. In old joinery the work was put together with wooden pegs, usually of oak. In very superior work this is done in the present day; indeed, in work not intended to be painted it is almost necessary to do so to avoid the unsightly appearance of nail-heads and screw-heads.

Locks for ordinary domestic work are of several kinds. Interior doors of a less thickness than 2 in. are usually fitted with a lock called a rim lock, the mechanism of which is inclosed in an iron box, which is screwed on to the face of the door. The box is usually made of cast-iron and japanned.

In America it has been, and perhaps still is, the custom to devote very much more care and expense to the ornamentation of rim locks than is the case in this country, the outer plates being frequently elaborate and beautiful pieces of metal work even in inexpensive locks.

When a Mortise Lock Is Used

When it is desirable to conceal the lock entirely, a mortice lock is used. The object to be aimed at in a mortice lock is compactness, so that the stile of the door shall not be unnecessarily cut into and weakened. This object was perhaps first successfully attained by a lock of American manufacture, in which the mechanism was arranged in so small a space that the mortice to receive it could easily be formed in the space between the tenons.

The depth of these locks was only 1¼ in. and the thickness ⅝ in. An additional advantage was the simplification of the labor of fixing. The top and bottom edges being rounded, the mortice could be made by simply boring two holes with a center-bit, and cutting away the space between them, the labor involved in making the mortice rectangular being entirely dispensed with.

A useful idea which is carried out by some lock-makers is to affix a number to each key and also to the plate of the lock. A register is kept of all locks and their destination, so that a lost key can be readily replaced or an additional key obtained merely by forwarding the number to the maker. It will be obvious also that such a system of numbering would obviate much inconvenience resulting from mixing up the keys of a large establishment.

Locks for front doors are nowadays commonly of small size, but are often of very excellent mechanism. One kind of lock for this purpose consists of a number of thin levers of brass or iron working side by side. Another kind is a solid bolt with a spring. Both kinds, when well made, are convenient and efficient. By an arrangement of small bolts acting on levers, these locks can be counter-locked, so that the key cannot be worked; they can also be held open when it is so desired.

Method of Fitting Door Handles

The usual method of fixing door-handles is a very poor contrivance. A screw, necessarily short, is inserted through the neck of the handle, to get what grip it may on the spindle, or bar, which passes through the lock. The consequence of fixing handles this way is that they are constantly coming off.

A more secure way is that in which the spindle is grooved, and the angles indented in a spiral direction. The inside of the handle is grooved in a screw form, and this screws on to and retains a firm hold on the spindle; when it is in the required position, a screw is inserted in the neck of the handle, and screwed down into the deep groove on the spindle; this holds the handles firmly in their proper position.

Latches to street-doors ought always to have a plate or curtain over the key-hole to keep out the dirt.

Large Apartment House for Staten Island

One of the most pretentious structures in the way of apartment houses on Staten Island, N. Y., is the building which has just been planned to provide living accommodations for 95 families and the estimated cost of which is placed at approximately $250,000. It will occupy a plot 200 x 150 ft. on Wall Street, between Stuyvesant Street and Public Lane, St. George, the structure itself being 200 ft. wide with an extreme depth of 138 ft. There will be four large outer courts and an interior court approximately 75 x 75 ft. in size.

Owing to the steep grade upon which the building will be erected, one facade will be five stories high and the opposite one six stories. The facades on all four sides will be of brick trimmed with terra cotta and Indiana limestone.

The roof treatment will be somewhat unusual and will be fitted up as a large roof garden with pergolas and seats.

There will be eighteen families to each floor, the suites consisting of three, four and five rooms each with bath. One of the specially convenient features will be the large number of built-in closets for which the plans provide. The architect of the improvement is Benjamin W. Levitan of 20 West Thirty-first Street, New York City.

Important Addition to a New York Department Store

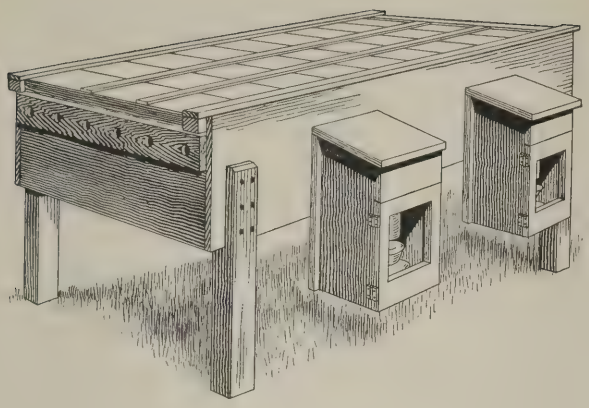
What will be when completed the tallest department store in New York City is about to be erected in the shape of a seventeen-story addition to the building at Broadway and Thirty-fourth Street, the estimated cost of which is placed in the neighborhood of $500,000. The addition will be erected on the westerly end of the present ten-story building and will extend from Thirty-fourth Street through the block to West Thirty-fifth Street, having a frontage of 47 ft. on the former and 50 ft. on the latter street, with a depth of 197 ft. 6 in.

The excavation for the basement and sub-basement to a depth of 24 ft. will be something of a task, owing to the fact that the rock backbone of Manhattan Island comes to the surface at this point. It is interesting to state that the foundations for the present ten-story building required something like two years to complete.

The plans for the seventeen-story addition have been filed by Architect R. D. Kohn of 56 West Forty-fifth Street and it is expected that work on the structure will be commenced at an early date. In order to make room for these additions, two brownstone dwellings in Thirty-fourth Street which for several generations were fashionable residences will be razed.

Daughter—Pa, what is your birthstone?

Father of seven (wearily)—The grindstone, I guess, my child.—*Pittsburgh Dispatch.*



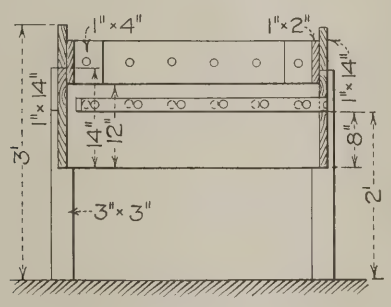
A Drying Apparatus for Fruits and Vegetables

A Simple Device Which Any Carpenter Can Readily Construct with the Aid of a Few Tools

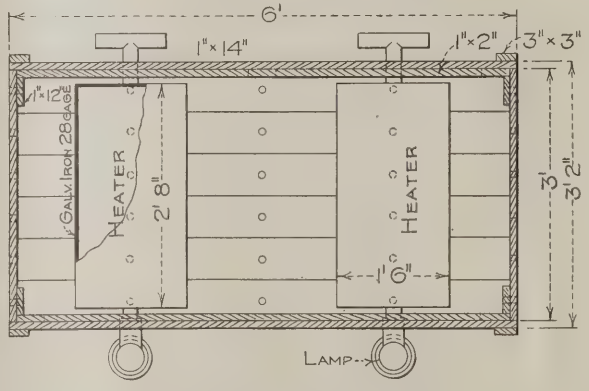
ENERGETIC efforts are being made throughout the country to conserve the food supplies by drying and canning the vast quantities of fruits and vegetables which have been produced, to the end that there may be no scarcity of them during the months which will intervene before another harvest season. A simple method of preserving great supplies of these perishable food products is by drying and in the accompanying illustration we show how a device for the purpose can easily be constructed by any carpenter or other mechanic handy in the use of tools.

The apparatus consists of a box mounted on four legs or supports, with proper ventilating holes as shown and a common hot bed sash as a means for concentrating the heat and preventing dust, flies and other vermin from contaminating the food. In order that drying may be carried on at night and on cloudy days, a pair of heaters and easily constructed radiators are provided. Almost every farm and suburban home has a hot bed sash and a brooder heater so that these features are readily provided.

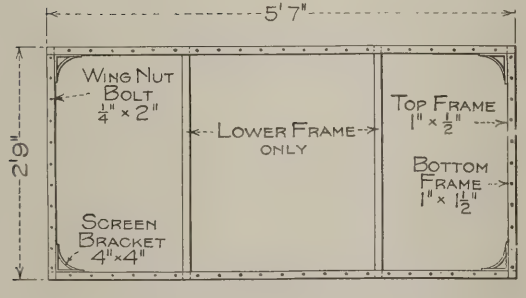
The drying rack consists of muslin with taped ends and sides attached to a light frame as shown in the illustration. Eyelets are provided in the tap-



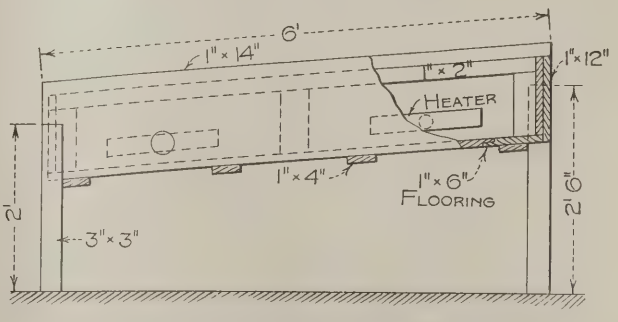
End View of the Apparatus



Plan of the Drying Apparatus



Plan of the Drying Screen



Vertical Longitudinal Section of the Dryer

Miscellaneous Constructive Details of the Drying Apparatus

ing to facilitate replacement on the frame when it becomes necessary to wash the original cloth.

The dryer here illustrated has about 17 sq. ft. of drying area and will handle half a bushel of material at one loading. A temperature of from 95 deg. Fahr. to 122 deg. Fahr. can easily be maintained with sunlight only, the lamps applying the same temperature at night, or the temperature can be increased to any desired useful point if run as auxiliaries to the sun in the day time. The lamps are of extreme value in drying such produce as corn or other rapidly fermenting vegetables as the process is so hastened by the extra heat that complete evaporation is obtained in a minimum of time. The heaters are so constructed as to supply a continuous current of fresh hot air at all times which makes rapid drying and insures a fine product containing all of the food elements.

The apparatus will dry all vegetables and fruit suitable for drying and as intimated above can be constructed by anyone capable of using tools. A device of this nature is illustrated and described in one of the reports on crop conditions sent out by the American Steel & Wire Company which points out that in early Spring an apparatus of this kind furnishes an ideal place to start young plants by placing a few wood strips over the radiators and putting shallow plant boxes on them. The lamps furnish the necessary bottom heat.

Those who wish to do their share along this line should call attention to the value of drying the surplus perishables so that the nation may be provided with food during the coming winter. Full directions as to the best method of preparing vegetables and fruit for drying are contained in what is known as Farmers Bulletin No. 841, copies of which can be obtained from the Department of Agriculture, Washington, D. C.

A "Snail-Shell" Stair

What is said to be "the only spiral concrete staircase of its kind in the world" has just been placed in the tower of the South-East Museum in Los Angeles, Cal., says a writer in *Engineering Record*. Similar stairways exist elsewhere, as in the tower of St. Paul's and the tower of the Cathedral in the City of Mexico, but they were built before the age of concrete. When viewed from above, its resemblance to the shell of a snail at once gave it a name.

"The South-East Museum helical staircase is built inside a well in the center of the tower, thus not only preserving for shelves or mounted objects the entire interior wall space of the tower, but also supplying on its own exterior wall additional space which may be employed for museum purposes. . . . The tower containing the stairway is seven stories in height, with three mezzanine balconies in the three upper stories, giving the equivalent of ten stories.

"The tower is 35 ft. square, and is supported by twelve columns and external walls 8 in. thick, reinforced with steel. It rests on a solid concrete slab or raft 3 ft. 6 in. thick. The total height is 125 ft. and the weight is 1000 tons. The construction was carried on continuously, a story being poured at a time. The staircase well is 9 ft. 2 in. in external diameter and is supported by four corner columns with 8-in. walls between them, with light and ventilation openings at each story. The stair is known as a caracole, on account of the likeness to a snail-shell presented by a vertical view, as shown in one of the photographs.

"With one exception it is the only helical staircase in America having a hollow center, the other one being an ancient stone staircase in the tower of the Cathedral in the City of Mexico. The stairway contains 160 steps with 7½ in. rise each, and was built around a galvanized iron form in the shape of a pipe, while wooden forms were placed for the stairs. Material was placed at a special rock-crushing and sand plant located about 1 mile from the building, in a dry river bed."

Production and Value of Hudson River Brick

The supply of common building brick for the enormous consumption of Greater New York, the largest brick market in the United States, comes principally from the narrow strip of land on either side of the Hudson from New York City to Cohoes, including Bergen County, New Jersey. Every county in this region contributes to the supply except one—Putnam—and in late years the Raritan district, in Middlesex County, New Jersey, has contributed largely to the Greater New York market.

In 1916 the number of brick marketed in this region, according to a report in preparation by the United States Geological Survey, Department of the Interior, was 893,552,000, a decrease of 66,975,000 brick. The value of this output, however, was $5,915,254, an increase of $906,189 over 1915. The average price per 1000 brick was $6.62, an increase of $1.41 over 1915.

The New York part of the region is by far the larger producer, reporting, for 1916, 702,596,000 brick, or 79 per cent of the total, valued at $4,552,468, or 77 per cent of the total for the region. This was a decrease of 38,972,000 brick, but an increase of $807,920 compared with 1915. The average price per thousand in this part of the region increased $1.43, or to $6.48. Ulster was the leading county in this part of the region, reporting 222,651,000 brick, valued at $1,444,275, a decrease of 6,692,000 brick but an increase of $333,783 in value, compared with 1915.

The New Jersey part of the region reported 190,956,000 brick, valued at $1,362,786, being a decrease of 28,003,000 brick, but an increase of $98,269.

President Harms of the National Association of Sheet Metal Contractors makes announcement of the appointment of the following program committee for the next convention of the association: Chairman, Paul L. Biersach, Milwaukee; A. W. Howe, Cleveland, Ohio; Otto Guessenhainer, Sheboygan, Wis., and H. C. Knisely, Chicago.

CORRESPONDENCE

A Department Where Those Interested Can Discuss
Trade Topics—Every Reader is Invited to Participate

Bevels in Roof Framing

From W. S. W., Hillsboro, Ohio.—In one of the issues of the BUILDING AGE, a short time ago, "C. F. S." of Brooklyn, N. Y., asked for an explanation of a little problem in roof framing which I will try and present to the best of my ability. In a square hip roof where the plan of the hip forms an angle of 45 deg. with the plate, take the length of the hip on the blade and the rise on the tongue of the steel square and apply to the square end of the hip; mark along the tongue which will give the bevel for backing the hip.

"C. F. S." desires to know the reason for this. I confess it does look a little queer for the hip and rise do not form a right angle. In connection with the accompanying diagrams I will endeavor to make the reason clear. I have shown the same plan with three different pitches, that in Fig. 1 having a pitch of 30 deg., that in Fig. 2 having a pitch of 45 deg. and that in Fig. 3 a pitch of 60 deg. It will be seen that this method works the same with any pitch. I have lettered all three diagrams alike so it will be easy to follow up the lines in all cases.

Referring to the diagrams, *a*, *b*, *c*, *d* and *a* represent the plate line; *b* and *d* and *a* and *c* the plan of the hips, *b* and *e* the run, *e* and *f* the rise and *b* and *f* the length of the hip.

Now using the well-known method for finding the bevel for backing the hip, take *e* as a center and a radius to come just tangent to the line *b* and *f* at the point *g* strike an arc as shown. Now draw the lines *a* and *h* and *c* and *h* which give the backing of the hip regardless of the pitch. Next draw the line *c* and *i* at right angles to the line *c* and *h* until it intersects the line *b* and *d* extended. Let *c* and *h*

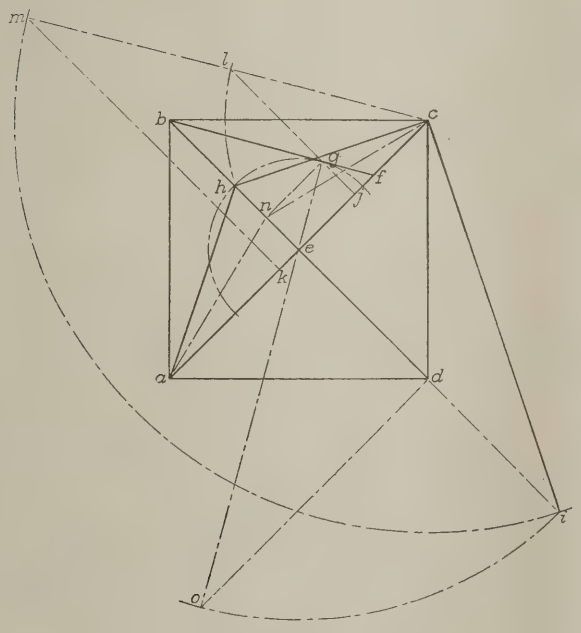


Fig. 1—Plan with Pitch of 30 Degrees

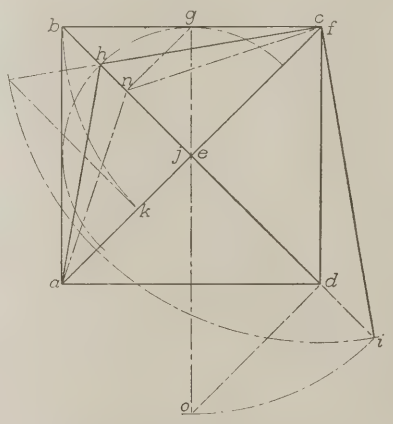


Fig. 2—Pitch of 45 Degrees

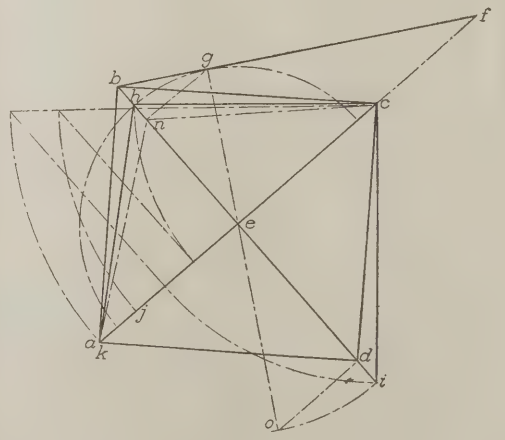


Fig. 3—Pitch of 60 Degrees

Finding Bevels in Roof Framing—Method Described by "W. S. W."

represent the tongue and *c* and *i* the blade of the square. Now make *c* and *j* equal *f* and *e* and *c* and *k* equal *f* and *b*.

In Fig. 1 draw *j-l* and *k-m* perpendicular to the line *a-c*. It will be noticed that *c-l* equals *c-h* and *c-m* equals *c-i*. Now *c-j* is to *c-l* the same as *c-k* is to *c-m* which shows that the ratio of *f-e* to *c-h* equals the rati of *f-b*, the length to *c-i*.

Owing to the different pitch of the three figures, it occasionally causes two letters to occur at the same place as in Figs. 2 and 3 for example, *c* and *f* and *j* and *e* in Fig. 2 and *a* and *k* in Fig. 3.

In working out the proportion in Figs. 2 and 3, it is done a little differently owing to the different pitch but I think the reader will from a study of the drawing readily understand it.

In Fig. 1 it will be seen that the rise *e-f* is shorter than *h-c* and the length *b-f* is shorter than *c-i* while in Fig. 3 the rise *e-f* is longer than *h-c* and the length *b-f* is longer than *c-i*. It will, however, be found that the proportion is the same regardless of the pitch. This is why we can use the length and rise on the square instead of finding the length of *h-c* and *c-i*. The right triangle *h-c* and *i-h* is what we are working from all the time.

Now if we use *b-e* as an axis and raise *f* until it is over *e*, then *g* is over *n*. Now if we take the square and use it in place of the line *h-c* and *c-i* placing *c* at the heel of the square at the plate and stretch a string from *h* to *i* using *a-c* as an axis and revolve until *h* is over *n* equal to the distance *n-g* and *i* is under *d* equal to the distance *o-d*, then the string *h-i* runs from *g* over *n* passing through *e* and on to *o* under *d*. It will then be seen that the string will run at right angles to *b-f*, the hip and the tongue *h-c* will be against the roof and over the line *n-c* also that the blade *c-i* will run diagonally down the side of the building under the line *c-d*.

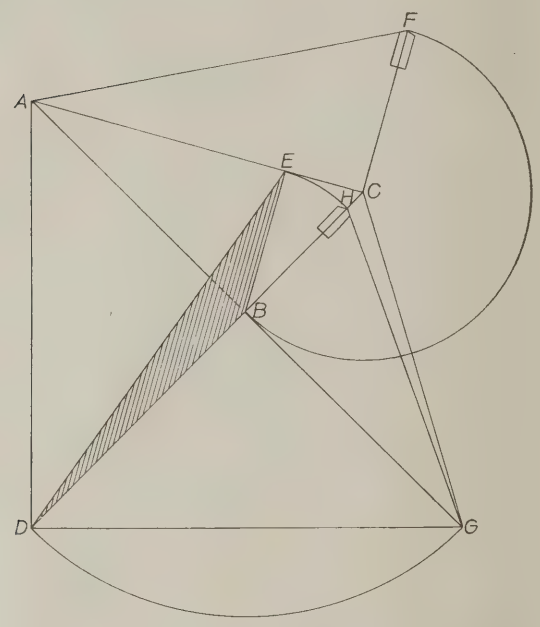


Fig. 4—Method of Backing the Hip

Method of Finding Bevels in Roof Framing as Described by G. L. Smith

From G. L. Smith, Indianapolis, Ind.—In looking over some of the earlier issues of the year I notice "C. F. S." asked why the length of the hip on one side of the square and the rise of the roof on the other gives the bevel for backing the hip when its angle is 45 deg. with the side of the building. Replying to this, I would say that in order to properly understand the query of this correspondent, he should study the three principal methods of backing a hip or valley rafter. The first of these is applying the bevel to the top of the rafter after the plumb cut is made; second, applying the bevel square against the side of or to the square end before the plumb cut is made, and third, working out the bevel at the foot of the rafter and gaging it as shown in Fig. 5 of the accompanying sketches.

The second method is the one to which the correspondent refers. In Fig. 4, we will suppose that *A-G-D* represent three corners of a plain hip roof with the lines *A-G* and *D-B* its diagonals or runs of hips. From the point *B* square up *B-C* to the rise of the roof. Connect *A-C* or *C-G* and the angle at *C* is the bevel required in the first method.

Second method—From a point *E* on the line *A-C* drop *E-B* square to *A-C*. Connect *D-E* and we have a section of roof when cut square to the hip. This, however, is distorted and cannot be measured either as to its sides or angles.

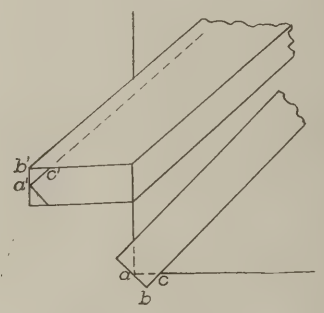


Fig. 5—Another Method of Backing the Hip

Set one foot of the compass at *B* and with *B-E* as radius, turn *E* over to *H* making *B-H* equal to *B-E*; also turn *D* over to *G* in the same manner. Connect *G-H* and the angle at *H* is the bevel required.

Up to this point, this method of demonstration will back any hip whether plan is a square corner or irregular; but in the triangle *C-B-G*, the base *B-G* only has a fixed or definite value. The other side *B-H* is a little different to obtain, hence we construct a similar angle, the sides of which are known by erecting a perpendicular at the point *C* on the hip *A-C*. Make *F-C* equal to *B-C* which is the rise of the roof. Connect *A-F*, then if the triangle

A-F-C is similar, that is proportional to the triangle *B-H-G*, the bevel at *F* will equal the bevel at *H* and the reason for his rule will be found.

By a well known geometrical principle, the triangle *B-E-C* is similar to the triangle *A-B-C* and

$$A\text{-}B : B\text{-}E :: A\text{-}C : B\text{-}C.$$

Now *A-B* equals *B-G* and *B-E* equals *B-H* and *B-C* equals *C-F*. Substituting these values in the above proportion we have

$$B\text{-}G : B\text{-}H :: A\text{-}C : C\text{-}F.$$

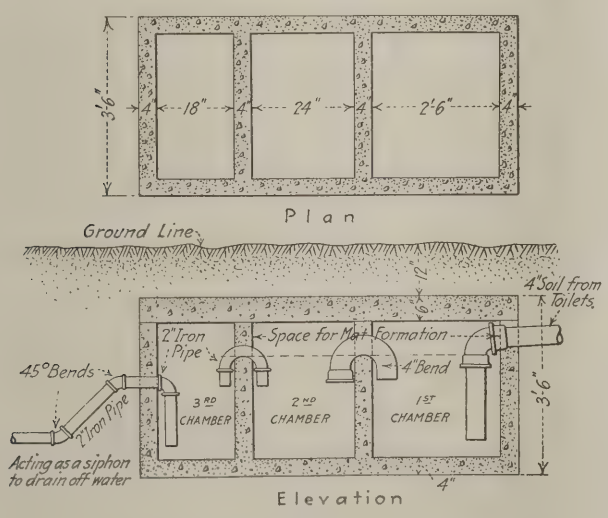
Thus the sides of these triangles being proportional and the included angle the same, the triangles are similar and the angle at *F* is equal to the angle at *H*.

Hence to lay off the backing for a hip rafter, where the end is square, take the length of the hip on one side of the square and the rise of the roof on the other side of the square and mark by the rise.

Another good method for backing hips is found in Fig. 5 of the sketches where *a-b-c* represents the plan of the foot of the rafter over a square corner; *a'-b'-c'* shows the elevation. Make *b'-c'* the same as *b-c* of the plan and gage the rafter as shown at *c'*. This will back any hip or valley whatever the corner may be. If the corner of the building is square, *b'-c'* will always be half the thickness of the rafter.

Some Comments on Septic Tanks

From M. H. G., San Diego, Cal.—I have read with interest the article in the August issue of the BUILDING AGE contributed by Harry Gwinner on sewage disposal and note in one portion of it that he speaks of troughs into which certain parts of the solids pass to be attacked by bacteria. Permit me to ask if this is good practice? As a novice, I recently constructed a concrete septic tank as an experiment using some new ideas and as it is acting perfectly some particulars regarding it may be of interest to other readers of the paper. I am therefore sending sketches, Figs. 1 and 2, which will make the construction clear.

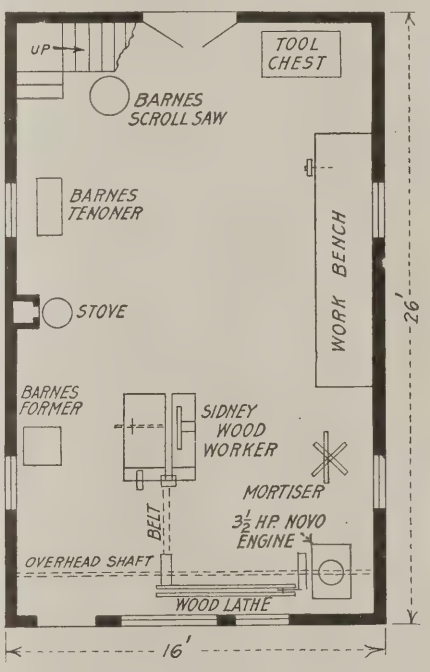


Plan and Elevation of Septic Tank as Submitted by "M. H. G."

The top slab is 6 in. thick and is 1 ft. under ground. The first chamber is 2 ft. 6 in. wide; the second chamber 2 ft. wide and the third chamber 1 ft. 6 in. wide. The discharge is about 100 ft. from the house and the liquid discharge is perfectly clear and free from smell. The tank has been in action about four months but my one great aim was to keep any solids from entering the drain.

Shop of an Ohio Builder and Contractor

From M. T. L., Kingston, Ohio.—Possibly some of the readers of the BUILDING AGE may be interested in the shop I operate which, though rather small, has the machines with which it is equipped so placed as to permit of rapid work. The building is 16 ft. wide by 26 ft. in length and the plan here presented gives a good idea of the arrangement of the machines, the workbench, engine, tool shed, stove and overhead shaft. I make use of a Sydney woodworker and several Barnes machines including former, tenoner and scroll saw. The window opposite the left-hand end of the wood lathe is raised when using the woodworker so as to allow long pieces of material to be passed through the window. The motive power is a Novo gasoline engine which is inexpensive to operate and is always ready for use. Its position adjacent to the wood lathe is clearly shown on the floor plan. The position of the mortiser is also shown.



Shop of an Ohio Builder and Contractor

I do a great deal of jointing and ripping at the shop and haul the material to the jobs on which it is to be used. I make no use of portable machines. At odd times and during bad weather I make and repair furniture, make window and door frames, stairs, etc. It may be interesting to state that I made all the furniture in our Masonic Lodge room with the exception of the chairs.

I have in my shop about 300 copies of the BUILDING AGE when it was known as *Carpentry and Building* and I often refer to them for information.

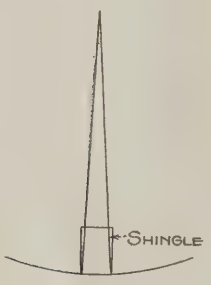
I might say that the shop is one and one-half stories in height and the second floor is used for lumber, etc.

Constructing a Gothic Roof for Barn

From R. W. W., Dayton, N. Y.—If "C. E. K." of Fiske, Saskatchewan, Canada, whose inquiry appeared on page 448 of the August issue of the paper will read closely the articles in the August issue of the present year and for May, 1915, he should experience no difficulty in obtaining the figures used on the square for the cuts which he requires.

Shingling a Cone-Shaped Roof

From Builder, Redford, N. Y.—Assuming that "W. A. W.," West Liberty, Iowa, gives the correct dimensions of his cone and that it is 11 ft. in diameter, then the slant height will be about 8 ft. He should draw two lines starting from a point as in the accompanying sketch making them 8 ft. long and as far apart at one end as the width of his shingle. Trim to fit the line and cut on one pattern.



Directions Wanted for Making a Light Brown Dye

From J. C., Detroit, Mich.—I come to the Correspondence Department for information in regard to a job which involves re-finishing a dining room table to match a china cabinet. The finish of the china cabinet is a very light brownish yellow which is rather dull in color. I have been unable to obtain any dye that would produce the proper effect and I therefore ask some of the readers to tell me how to make a dye of this nature.

Can one obtain the primary colors in dyes so it would be possible to secure the different shades?

A Carpenter Shop in a Quaint Town

From A. L. Fisher, Nantucket, Mass.—I have noticed in some of the more recent issues of the paper reference to carpenter shops operated in different sections of the country and thinking the readers might be interested in my shop I am sending a few particulars. My little shop is located on Water Street in the quaint old town of Nantucket, overlooking a beautiful harbor that is full of life and prosperity, where hundreds of tourists arrive every day during the summer and enjoy the bracing air, the delightful bathing, boating, fishing, etc. My shop is devoted largely to jobbing, cabinet-making, repairing antiques, crating, etc., and is operated by hand power only. It is a quaint little shop where one can do an honest day's work with health and comfort and not be crazed with the noise of the buzz saw or whirling motors. The writer has had twenty years' experience in this kind of work and knows whereof he speaks.

Remedying a Squeaky Floor

From Contractor, Clinton County, N. Y.—If "W. J. M.," Lakewood, Ohio, whose inquiry appeared in the August issue of the paper, can get at the underside of his floor and he has floor lining, he should put screws through the floor lining into the floor. If he has no floor lining, he may screw strips to the underside of the floor. If he cannot get at the underside of the floor, he may use a Forstner bit and put screws in the joists or put nails in the joists. The nails should be 10d finish. If screws are used on top, the holes should be filled with wood.

Troublesome Chimneys

From G. C. C., New Jersey.—I would be glad to have the readers give me their views as to the best method of correcting some leaks in a defective chimney. I presume the trouble is caused by porous brick. I have trouble with two such chimneys and am positive that the leaks come from moisture absorbed through the brick as I have made necessary connections to the chimney and the roof with flashing when making repairs. I would like to know if there is a waterproofing paint that can be applied to light colored pressed bricks without discoloring them.

Getting Out a Quarter-Turn Wreath on the Band Saw

From W. S. W., Hillsboro, Ohio.—In answer to "W. W.," New York, in a recent issue of the BUILDING AGE, I am sending the following explanation as to the method of getting out a quarter-turn wreath on the band saw; also a drawing showing how to lay out the work. I am also sending a drawing showing an apparatus I made several years ago for sawing out this kind of work. It is nothing but two boards hinged together with a fence screwed on the top board. The correspondent can cut a board the same angle as the pitch or any other

angle he may wish and slip it in between the two boards, drive a little nail in to hold it in place and this will give the pitch he wants. Then take a thin board as shown at *A* and clamp it on as shown allowing it to project over one end. Then screw the piece to be sawed to this board and saw through the blocks, board and all. Always do the outside sawing first so that the piece will not drop off until you saw the last line.

The stairs should be of such a nature as to give the wreath the same pitch as the rest of the rail. To do this draw the line *b-c* and make *b-d* the width of a tread. This is the first step below the landing. Make *d-e* equal to *b-d* the width of a tread. Now draw *c-f*. Next with *c-e* as a radius find the center at *g* and draw the center line of the rail. Now mark the width of the rail *l-h*, and draw the inside and outside lines.

Now lay off the elevation of a few treads and risers and draw the pitch line *i-j*. Next divide the inside line into any number of equal parts as for example, 1, 2, 3, etc., and divide the first riser above the landing into the same number of equal parts as 1′, 2′, 3′, etc.

The center of this wreath will have the same pitch as the line *i-j* which is the pitch of the straight rail. The inside of the wreath will be steeper than this but the center will be less steep.

Draw perpendiculars from 1, 2, 3, etc., and horizontal lines from 1′, 2′, 3′, etc. The intersection of these lines will give points through which to trace the curve which will be the pitch of the inside of the wreath.

Now we must lay off the top of the blocks to saw to first. Draw *k-l* and make *q-n* equal *g-4* and *q-m* equal *g-w*. This will be the minor axis.

Now with a radius *k-s* and a center at *n* strike the arcs at *p* and *p′*; then with radius *k-s′* and a center at *m* strikes the arcs at *o* and *o′*.

Now stick pins at *p* and *p′* and fasten the end of the thread to one pin and holding the pencil at *n* draw the thread around it and around the other pin holding it tight and trace the curve with the pencil keeping the string tight. Do the same with the outside curve.

Now draw *v-t* and *v′-t″*. Next draw *t-q*. Do the same on the other end. From *t* to *r* is the twisted part of the rail. If you want a straight shank at each end to get the stair bolt in so as to join it on the straight rail, draw a tangent at each end as *t-t′* and *r-r′*; mark the end of the shank as at *u* and *u′*, then this will be the line to which to cut after you have sawed the inside and outside.

The reader may think *u* and *u′* should be square across the rail on the top side of the block but this is owing to the shape the rail lies in the block. They are square across the rail, as the reader will see from an inspection of the plan.

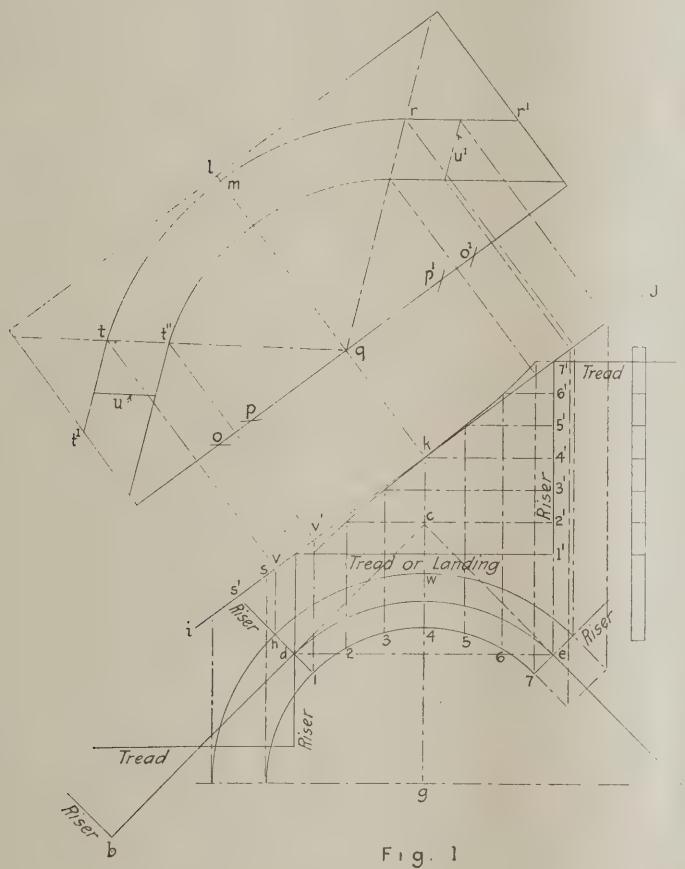


Fig. 1

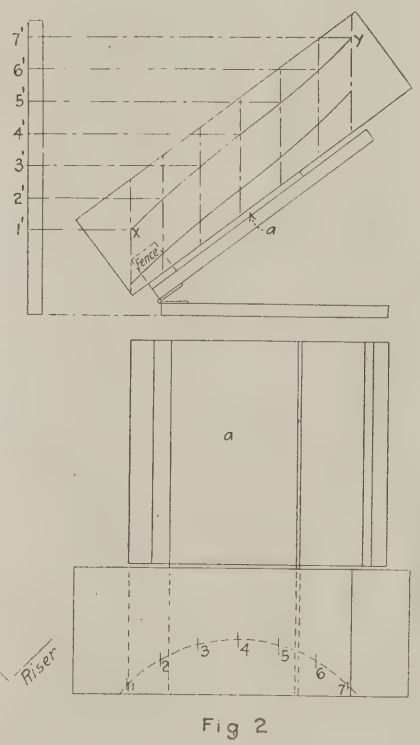


Fig 2

Getting Out a Quarter-Turn Wreath on the Band Saw as Described by "W. S. W."

Now we have all the lines necessary on the top of the block. Next place the block on the board as shown in Fig. 2 and saw out the inside curve. I have shown the block in Fig. 2 rather small but in gluing up the block—if we have to glue it up—make it large enough; for the little timbers you will waste will not be worth as much as your time in making a drawing of all the lines in the wreath to find out just how small a block you can use.

When you have sawed out the inside line set the form on the drawing so the block will be right over the plan. Now take the steel square and draw plumb lines on the inside curve of the block and number them on the block the same as they are on the drawing, 1, 2, 3, etc. Now take a little stick and transfer 1′, 2′, 3′, etc., from Fig. 1 on to it and apply it to the inside curve of the block as shown in Fig. 2. This will give the points through which to trace the curve.

Now we have the line on top of the block *u* and *u′* to serve as a guide by which to cut off but we must also have a line on the inside of the rail. To get this take the pitch board and stand it on end with the rise down and the tread perpendicular and with the sloping side to the right. Set it to the line *u* and mark on the sloping side; hold it the same way and move around to *u′* and mark on the sloping side again. Now we have a line across the top of the block and on the inside of the rail it would just fit the square end of the straight rail. If we locate the point *x* and *y*, Fig. 2, and take a straight strip of paper as wide as the rail is thick, having the ends cut square and then bend it around the curve with the top edge touching the point *x* and *y* and mark around the paper on both edges and both ends without letting the paper move, it will give the end cut and the line to which to band saw.

Now we can band saw the outside line of the wreath. Then it will drop off. Now cut off the ends to the lines established and put on a narrow saw with plenty of "set" in it. Lay the wreath with the back or outside down and saw to the line on the inside. Keep turning the wreath so that it touches the table right at the saw all the time.

Now we must be very careful for after we leave the straight shank it is twisting on the saw all the time until we get to the straight shank on the other end. Saw a little end off the straight rail and mark both ends of the wreath and mold it out by hand.

A Farmhouse of the Cottage Type

An Arrangement of Rooms Which Secures Unusual Privacy for the Family of the Owner

WE have taken for the subject of our colored supplemental plate this month a modern farmhouse of frame construction and of what may be termed the cottage type of architecture. It has been designed for a corner of the farm land so that the manager can have a good view from his office of what is going on and thus oversee the workmen. The house has a ground area of 32 ft. frontage and a depth of 61 ft. The plan is compact and all space is utilized to good advantage. One outstanding feature of the design is the arrangement of the rooms for the family of the owner, which are entirely separated from that portion of the house occupied by the hired help.

The Men's Washroom

At the rear of the house is located a porch, where the men coming from the field enter the wash room. Here they can clean up before going to their rooms located on the second floor or attic and which are connected with the wash room by means of the flight of rear stairs, as may be seen from an inspection of the main floor plan. This arrangement of the wash room eliminates or rather renders unnecessary the men going into the kitchen to wash and interfering with this part of the household work. The wash room is connected directly with the kitchen, as well as attic, and contains a large wash basin, adjoining which is a toilet with closet for the workclothes of the men which they use in the field.

The kitchen is large and contains a combination coal and gas range, sink and closet, and it is in this room that the meals for the farm help will be served. The kitchen is connected with the dining room through a commodious pantry.

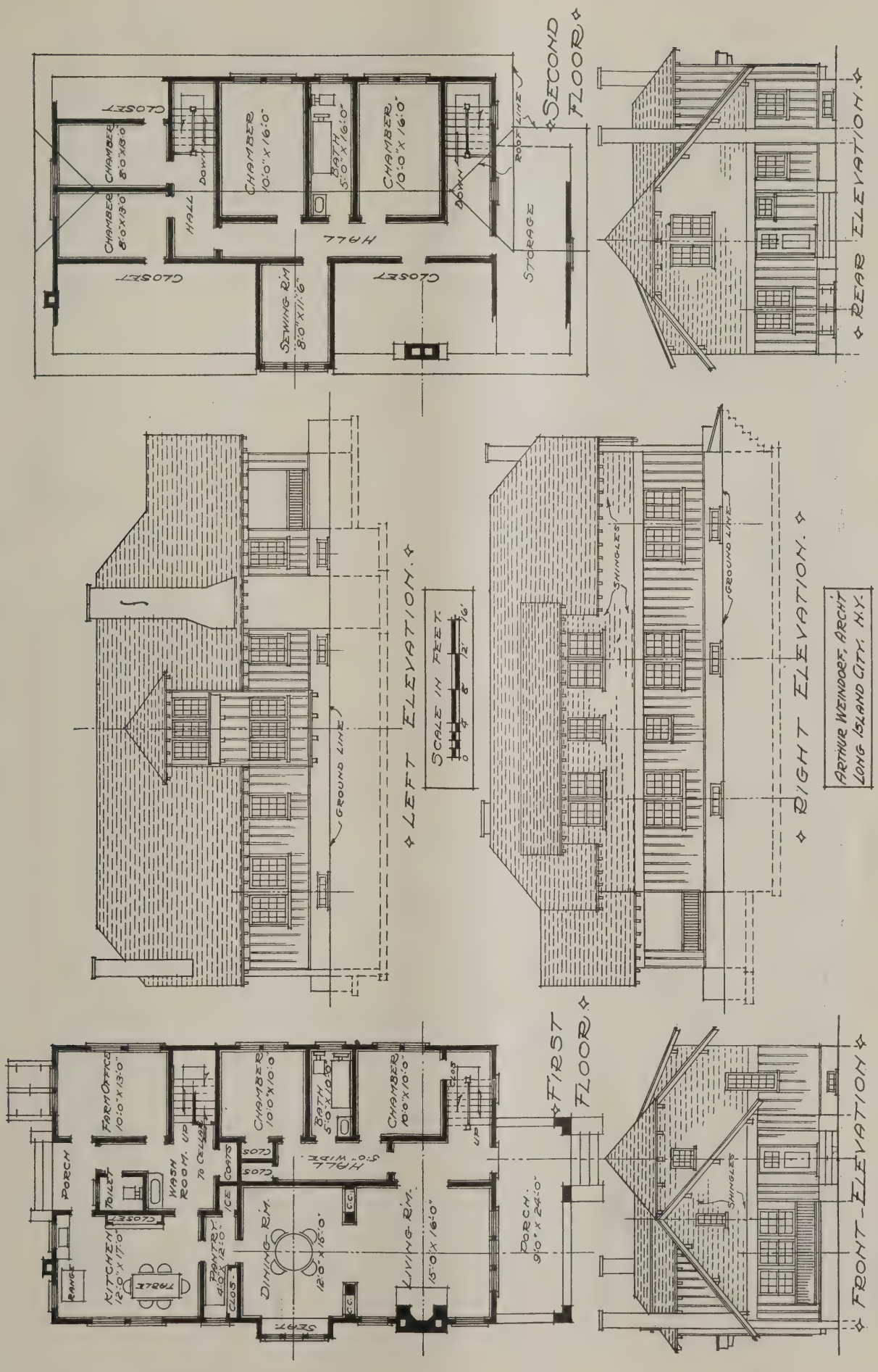
The dining room is of good size and contains a large window seat. The room is connected directly with the living room by a columned opening and between the columns and the separating wall, china closets are built.

The Living and Dining Rooms

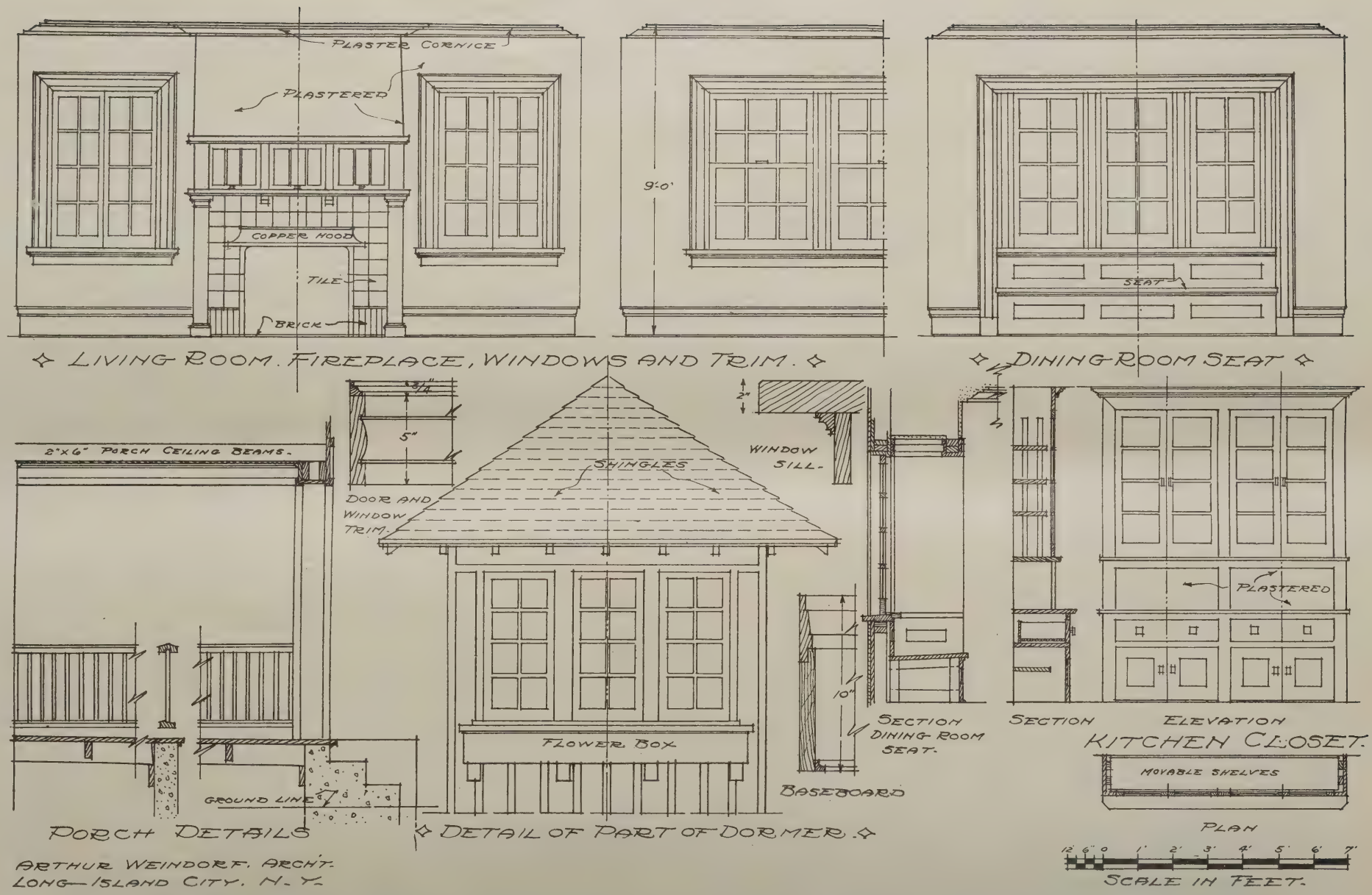
The living room is somewhat larger than the dining room, and contains a fireplace, which is so placed as to face the door from the hall. The two rooms can be used together when the dining table has to be stretched to accommodate the folks for the big dinners that are given at various times of the year.

The bed rooms and bath of the farmer's family are separated from the rest of the house by a private hall, as shown on the floor plan.

In the attic or second story are located four sleeping rooms, a sewing room, a bath room and a large storage closet at the front and another under the roof toward the rear. Two of the sleeping rooms are connected directly with the farmer's living quarters by means of the stairway at the front of the house.



Plans and Elevations of the Farmhouse of the Cottage Type Shown on the Colored Supplemental Plate



Miscellaneous Constructive Details of the Farm House of the Cottage Type Shown on the Colored Supplemental Plate



BUILDING AGE
NEW YORK

Referring now to the main floor plan, it will be seen that the farm office is located at the rear of the house and is a place where the farmer can plan out his work and take care of the various problems which arise during the year. In these days of advancement in the raising of farm produce and the breeding of cattle, a file system and data of costs must be kept and the farm managed on a business basis.

The Basement and the Foundations

According to the specifications of the architect, a cellar is to be located under the entire building and in it is to be provided a large furnace room, a laundry, a large cold storage room, which is separated from the rest of the rooms, and such other features as may be found necessary or desirable.

All foundation walls and footings are to be of concrete, the walls to be 8 in. thick and supported on footings 10 in. deep and extending 6 in. beyond each side of the wall above.

The chimneys which are to take care of the furnace and kitchen range are to be built of brick laid up in good cement mortar and all flues lined with vitrified flue lining. The chimneys are to be supported on concrete foundations. Where the chimneys are exposed to the exterior they are to be covered with stucco.

All concrete used is to be mixed in the proportions of one of cement to three of sand and five of broken stones not larger than will pass through a 2 in. ring.

The Framing Timbers Used

All framing timbers are to be of spruce. The corner posts are to be 4 x 6 in., the plates 4 x 4 in., the girders 6 x 8 in., the first tier of floor beams 2 x 10 in., the second tier of floor beams 2 x 8 in., the second floor ceiling beams 2 x 6 in., all placed 16 in. on centers and fastened with 2 x 2 in. cross bridging placed 6 ft. apart.

The studs are to be 2 x 4 in. and spaced 16 in. on centers and doubled at all openings. One row of cross bridging is to be placed in all studding. The rafters are to be 2 x 8 in. and 2 x 6 in. and spaced 20 in. on centers. The porch floor beams are to be 2 x 8 in., and the ceiling beams 2 x 6 in. all spaced 20 in. on centers.

The Exterior Covering

The entire exterior frame of the building is to be covered with 1 x 9 in. hemlock sheathing laid diagonally. This is to be covered with 3 ply building paper, over which is to be laid 8 in. boards running vertically with the joints covered with battens.

The rooms of the main story are to have double floors, the finish floors being maple in the dining and living rooms, while the other rooms are to have floors finished with comb grain North Carolina pine. The attic floor is to be single and of pine. The trim for the entire house is to be of cypress.

All the rooms are to be plastered with a hard smooth finish except the dining and living rooms, which will have a sand finish.

The rafters are to be covered with roofing boards, over which is to be placed a good quality of building paper, and upon this metal shingles are to be laid. With the many patterns available in the market almost any desired effect may be obtained. The exterior cornice, rails, brackets, etc., are to be of white pine.

The Trim Used

The trim in all the rooms is to be finished natural. It is to be well filled, brought to a smooth surface, and varnished two coats.

The floors are to be brought to a smooth surface, filled and varnished, the living and dining rooms to have an additional coat of wax.

All exposed exterior trim is to be painted three coats of white lead and linseed oil.

A good system of plumbing is to be installed. In the kitchen will be placed an iron enameled sink, a 40 gal. galvanized iron boiler and a range. A gas range and a three-part wash tray of soapstone will be located in the cellar.

The Plumbing Fixtures

All plumbing is to be exposed and all rough pipes are to be painted with an aluminum paint. The plumbing in the bath room is to be of the open type. The bath tubs are to be iron enameled, the water closets are to have china bowls and high tanks, and all wash stands are to be one piece enameled iron. The exposed pipes are to have a nickel plated finish. All fixtures are to be supplied with hot and cold water.

The house is to be heated by steam and the radiators of plain design are to be located in all rooms except the kitchen and the pantry. The furnace and radiators are to be of such a size as to properly heat the building in zero weather when given proper attention.

All the sheet metal work is to be painted on both sides before it is laid. All leaders are to be of galvanized iron and of a neat square design. Galvanized iron hanging gutters are to be placed where necessary.

All hardware is to be of a bronze plate finish and to match the lighting fixtures and radiators.

The Lighting System

The lighting is to be by means of electricity and gas and combination fixtures are to be installed. Two drop pendants are to be used in the living room and dome in the dining room.

In this case the architect estimates the cubical content of the building to be 45,954 cu. ft., on which he places a unit cost of 6c. per cubic foot. This figure, however, does not include the contractor's profit. He allows $800 for the masonry work, including concrete footings, foundation walls, chimneys, fireplace; $4,300 for the carpentry work, including the lumber bill and mill work; $350 for painting, staining and printing; $470 for the heating; $430 for the plumbing and gas fitting, and $450 for the plastering.

The house shown on the supplemental plate was designed and the specifications prepared by Arthur Weindorf, Long Island City, New York, or care THE BUILDING AGE, 243 West Thirty-ninth Street, New York City.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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OCTOBER, 1917

The New York Building Conference

In our last issue we referred to a movement which was then being launched to bring together for a conference on the New York building situation, architects, builders, contractors, real estate men, dealers in supplies, etc., with a view to determining, if possible, "why building construction should not be permitted to proceed." As a result of the steps which were being taken, a meeting which was undoubtedly the largest of its kind held in the city for many years, took place on Thursday, Sept. 20, in the office of Borough President Marks. There were present something over 200 builders and material manufacturers, bankers, officers of large loaning institutions, real estate men, and labor representatives when President Marks opened the meeting by calling attention to the stagnation of building activity in New York City the present year. He pointed out that during the first eight months plans filed for new structures in Manhattan aggregated $23,852,925 in estimated cost while in the same period in 1916 plans were filed for new buildings estimated to involve an expenditure of $100,987,645 and of nearly $51,000,000 for a similar period in 1915. Opinions as to the situation and the manner with which it might be dealt were expressed by several of those present. The Comptroller of one of the largest institutions in the city loaning money on new buildings, admitted that his company had stopped making building loans because it was afraid to lend under present conditions. A member of the Building Trades Employers' Association aroused the patriotism of the meeting by stating that notwithstanding the present hardships, the builders of the country were loyal to the Government. As a result of the interchange of ideas, a resolution presented by Allen E. Beals, favoring the appointment of a Commissioner of Peace Industries, was unanimously adopted. It provides that a committee be appointed from all the leading building trades, the Merchants' Association, the Real Estate Board, the New York Chapter of the American Institute of Architects, and labor organizations "to make a careful study of price conditions and ascertain from architects how many buildings have been postponed through failure to obtain loans and difficulty in securing materials." The situation is certainly one calling for earnest consideration and it is to be hoped that the movement under way may result in devising ways and means which will stimulate building operations in the Metropolitan district.

Demand for Building Materials

In view of the fact that war demands for steel are likely to increase to such an extent as to absorb the output of the mills an urgent plea is made by the Chamber of Commerce of the United States cooperating with the Council of National Defense to use steel for general business purposes only when the requirement is unavoidable. Lumber and concrete are strongly advocated instead and there comes the intimation that unless a steel substitute is found, some manufacturers may be obliged to curtail or even suspend operations during our participation in the European conflict. It is pointed out that materials which can be used in substitution for steel are plentiful in comparison. Lumber may be expected to meet all needs and cement may be had in quantity for concrete work. While there may be delays in getting supplies of these materials, a hopeless shortage does not exist. The committee urges that every effort should be made to use wood and concrete in place of steel wherever this can be done, and construction and development work requiring steel should be postponed wherever possible.

In purchasing materials and supplies it is argued business men will doubtless consider the wisdom of

confining their operations so far as possible to doing business locally. The extraordinary service being rendered by the railroads in connection with the war will limit general transportation service and put an end during the war to the condition which has developed during the past fifty years through the prompt and reliable transportation facilities afforded by the railroads. No longer can a man in Illinois rely upon Pennsylvania as a dependable source of supply for raw materials and equipment. For many commodities the railroads can no longer spare the equipment to bring distant points into close contact. Purchases must be made near at home wherever this can be done. The preference which must be given to shipments of iron and steel will soon make this situation of daily importance.

Wisconsin Architects to Be Registered

An architects' registration law has been passed by the Wisconsin Legislature providing that after Jan. 1, 1918, no person doing business in Wisconsin shall make use of the title architect, or so represent himself without a certificate of registration. A board of five examiners will have full power to prescribe rules and regulations for the examination and registering of architects. Candidates will be required to submit satisfactory evidence as to their thorough knowledge of building construction, building hygiene, architectural history and mathematics. Five years' experience is also required.

In lieu of examination, the board may accept a diploma of graduation from a recognized architectural school supplemented by at least three years' experience. Examination may also be waived in cases where an architect is registered in another state or country having satisfactory standards. Any person already engaged in the practice of architecture at the time of the passage of the bill may receive a certificate without examination.

New Building Code for Portland

The new building code of Portland, Oregon, limits the height of buildings to eight stories and they must not exceed 110 ft. above the street line. They must be set back 1 ft. from the property line for every four stories in height. In masonry construction a reduction has been made in the thickness of the walls required, in some cases a reduction from 12 in. to 8 in. being permitted. The tables regarding the thickness of walls have also been greatly simplified.

Buildings under the new code are divided into seven classes, namely, absolutely fireproof; ordinary fireproof construction with steel frame; ordinary fireproof construction with reinforced concrete frame; semi-fireproof; mill construction; other masonry construction; and frame construction.

The provisions regarding reinforced concrete buildings have been made to adhere closely with the report made in July, 1916, by the joint committee of the American Society of Civil Engineers, American Society of Testing Materials, American Railway Engineers Association, Portland Cement Association and the American Concrete Institute.

Class in Heating and Ventilating

Circulars are being distributed by the New York School of Heating and Ventilating announcing that the first meeting of the fifth annual season will be held in Room 512, World Building, New York City, on Monday, Oct. 1, for registration of applications to the first-year course, which consists of eighteen lectures, and is the course which has been so popular for several years back, as it enables the young man to grasp the science of heating and ventilation from a complete understanding of the heat unit and its application to the arrangement of different kinds of heating systems. The second-year course will open on Wednesday, Oct. 3, and consists of twelve lectures devoted more particularly to high-pressure work, piping equipment, isolated plants, central heating plants, and similar work.

The course, as heretofore, will be in charge of Charles A. Fuller, 101 Park Avenue, consulting engineer with Clark, McMullen & Riley. Those who desire further information, or the circular issued by the school, should address George G. Schmidt, 512 World Building, New York City.

The Columbus Building Show

Ohio builders and building-supply men are interested in the Columbus Real Estate and Building Show, to be staged jointly by the Builders and Traders' Exchange of that city and the Real Estate Board in the large buildings at the State Fair Grounds, Jan. 21 to 30, 1918. A mammoth exposition is planned, and every phase of the building industry will be represented. M. A. and L. C. Vinson, who successfully managed the Cleveland and Akron building shows, have been retained to manage the Columbus show.

Death of James P. Beck

The trade will regret to learn of the death on Sept. 8 of James P. Beck, general manager of the Portland Cement Association with headquarters at 111 West Washington Street, Chicago, Ill. Mr. Beck was born Jan. 27, 1886, at Odell, Ill., and was graduated from the University of Illinois in 1907. After his graduation in June, 1907, he entered the employ of the Universal Portland Cement Company. Two years later he was made publicity manager of that company and during the Fall of 1915 was chosen to formulate plans for broadening the scope of work of the Association of American Portland Cement Manufacturers with headquarters at that time in Philadelphia. He was later made general manager of the association to put into effect and carry out the plan which he formulated.

Brief Review of the Building Situation

Figures Showing Building Activities in Various Sections of the Country in August, 1917, and August, 1916

THE seemingly unfavorable conditions in the building industry as revealed by the accompanying report, showing as it does a loss of 26.93 per cent in the estimated cost of new construction work in 117 cities for August as compared with August, 1916, are due in large measure to continued unsettled conditions growing out of the gigantic requirements of the government. Prospective taxation and new levies of men are important factors, as is the shortage in transportation facilities and the lack of building mechanics, who have been called to work on army cantonments and other government enterprises.

In rural districts where farmers are reaping the benefits of high prices, there is likely to be a large amount of construction done in the near future, and the outlook for coming months appears much brighter than the present report would seem to indicate.

The Eastern section of the country shows a loss of 34.09 per cent for August, 1917, compared with August, 1916, 44 cities reporting.

CITIES OF EASTERN STATES

	August, 1917	August, 1916
Albany	$220,650	$880,575
Allentown	38,455	245,035
Altoona	14,685	120,217
Atlantic City	127,692	47,131
Bayonne	57,873	118,530
Binghamton	99,614	296,754
Boston	5,319,000	5,397,000
Bridgeport	353,537	643,304
Brockton	50,375	149,812
Buffalo	1,210,000	1,756,000
East Orange	43,184	43,620
Erie	230,785	313,785
Harrisburg	188,740	107,749
Hartford	422,065	547,390
Hoboken	23,950	95,623
Holyoke	12,470	41,700
Lawrence	70,200	68,200
Manchester	43,195	164,806
Newark	566,618	564,801
New Bedford	691,787	111,840
New Haven	578,284	383,705
New York:		
Manhattan	2,041,296	4,350,001
Bronx	846,235	1,074,188
Brooklyn	1,700,945	2,711,600
Queens	919,640	1,216,782
Richmond	645,984	1,110,525
Niagara Falls	230,881	185,640
Passaic	87,800	132,650
Paterson	152,390	159,553
Philadelphia	1,554,115	4,472,120
Pittsburgh	707,520	1,442,467
Portland	333,100	497,385
Quincy	100,500	480,355
Reading	37,975	112,500
Rochester	384,641	557,730
Scranton	54,233	155,177
Schenectady	110,614	187,202
Springfield	144,835	370,105
Syracuse	338,270	207,000
Trenton	321,990	258,026
Troy	13,378	414,760
Utica	53,900	125,050
Wilkes-Barre	79,908	64,314
Worcester	531,640	628,176

The middle section of the country shows a loss of 23.3 per cent, this being especially noticeable in such cities as Detroit, Akron, Kansas City, St. Louis and Toledo.

CITIES IN MIDDLE STATES

	August, 1917	August, 1916
Akron	$860,917	$2,450,142
Canton	110,310	309,805
Cedar Rapids	195,000	117,000
Chicago	4,277,650	5,783,000
Cincinnati	926,795	1,328,490
Cleveland	4,579,215	2,752,445
Columbus	283,925	548,720
Dayton	131,020	250,775
Des Moines	110,850	139,183
Detroit	2,035,750	4,382,825
Dubuque	38,150	106,650
Duluth	461,733	287,590
East St. Louis	60,572	151,109
Evansville	51,384	137,866
Ft. Wayne	281,175	266,240
Grand Rapids	141,299	438,650
Indianapolis	834,455	1,052,330
Kansas City, Kan	62,205	51,385
Kansas City, Mo	603,340	1,211,225
Lincoln	89,580	266,130
Milwaukee	953,961	611,202
Minneapolis	745,425	1,403,895
Omaha	775,625	652,835
Peoria	112,080	431,300
Saginaw	56,698	72,350
St. Joseph	79,680	65,995
St. Louis	807,696	1,162,253
St. Paul	506,214	890,142
Sioux City	216,975	186,475
South Bend	218,223	131,997
Springfield	55,180	193,970
Superior, Wis.	112,870	250,940
Terre Haute	19,525	48,375
Toledo	375,534	1,348,197
Topeka	49,318	152,018
Wichita, Kan.	80,655	36,675
Youngstown	512,105	293,500

There are 20 cities reporting from the South, and show a loss of 18.68 per cent.

CITIES IN SOUTHERN STATES

	August, 1917	August, 1916
Atlanta	$688,654	$348,031
Baltimore	480,247	946,406
Birmingham	112,255	248,471
Charlotte	112,225	132,650
Chattanooga	62,525	93,825
Dallas, Tex.	145,159	310,499
Huntington	127,885	127,560
Jacksonville	209,166	199,735
Louisville	64,945	321,550
Memphis	244,335	281,765
Montgomery	8,964	26,040
New Orleans	232,181	143,445
Norfolk, Va.	45,566	60,740
Oklahoma	171,150	127,025
Richmond	111,624	359,566
Savannah	43,900	96,590
San Antonio	178,300	207,245
Tampa	21,500	117,985
Washington	1,038,480	1,192,778
Wilmington	416,923	188,411

The extreme Western cities show the smallest loss of any of the four zones reporting, the figures being 5.98 per cent.

CITIES IN EXTREME WESTERN STATES

	August, 1917	August, 1916
Berkeley, Cal.	$134,000	$120,475
Colorado Springs	18,980	30,981
Denver	518,350	261,950
Los Angeles	891,485	1,037,320
Oakland	388,159	416,810
Pasadena	103,057	263,705
Portland	54,610	64,765
Pueblo	19,530	30,945
Sacramento	352,228	252,630
San Diego	116,439	71,673
Salt Lake City	101,850	277,828
San Francisco	1,217,691	993,020
San Jose	21,385	24,897
Seattle	464,765	668,764
Stockton	54,485	86,390
Tacoma	39,880	180,675

BUILDING AGE

THE DEALER'S DEPARTMENT

Annoying Practices in the Lumber Trade

Tell your Troubles in This Department Concerning Unethical Shipments by Lumbermen

Wholesalers Are Also Invited to Counter with Recitals of Unethical Actions of Retailers

By C. E. Davidson

NONE of us care to admit our wrongs or errors. It is an unpleasant subject. It results in the opprobium, "kicker," "knocker," etc., yet, criticism applied in the proper spirit is wholesome for all of us.

Ever since I became interested in the lumber business some twelve years ago, I have had recurring instances of unethical shipments from wholesale lumber dealers—not, mind you, from what would be termed unnreliable mills, but from some of the largest in the country, whose managers would be terribly "miffed," no doubt, if charged with unethical shipments.

These results are no doubt due to the circumstances and surroundings of the business. Or is it habit, indifference, lackadaisical business methods, lack of integrity in making shipments, lack of a perfect co-ordination of the sales, the order, and the shipping departments? Personally I think it is due to a lack of perfect system and understanding between the salesman, who promises, and the mill, which delivers.

At the outset I want to say that in all the years I have been connected with the lumber business we have never had one "kick" to make to a cypress concern. Every piece comes perfectly manufactured, up to grade, and just the quantity ordered. The yellow pine manufacturers are about the worst sinners of all of them, with the Douglas fir people not far behind, and my purpose is to see, if by proceeding without malice, without undue or unwarranted charges of any kind, I cannot gather a volume of such transgressions and by presenting these to the manufacturers at their next annual, the subject cannot be taken up and the matter mutually remedied. I am aware there are some scamps in the camps of the retailers. We retailers are perfectly willing to discipline them through our associations. We simply want the facts, only facts, no exaggerations, but an earnest desire to ferret out the difficulties involved and correct them.

My idea is to ask every lumberman who reads this to sit down and send me a report on any shipment in which he was mistreated either through grades, or loading heavily on some undesirable length, etc.

I will not publish in Building Age the names of the concerns, but in your report I want the names, the number of the car, if convenient, the approximate date, and briefly, first, a statement as to what was ordered, second, what you received, and third, the approximate loss to you. Make it brief, but full enough that the facts can be gleaned. These will be compiled by me and forwarded to the wholesale association for their information. If names are desired to be withheld, so state and they will not be disclosed.

WANTED — The name and address of a dealer who has not had any experiences of the annoying kind Mr. Davidson describes in this article. You want what you want when you want it, of course—but do you get it? Here is a practical suggestion for the elimination of one of the most serious problems of the retail buyer, through the development of a better understanding between the manufacturers and the dealers.

In the great majority of cases, no question of honesty is involved; the trouble is caused by lack of understanding. In the few instances where either party to a sale is wilfully unfair, co-operation affords no remedy.

Tell your troubles to Mr. Davidson.

I have no malicious purpose in undertaking this task, but only desire to correct an evil for which there can be no excuse. There is no good reason why the lumber business should be conducted on a loose and in some instances almos tdishonest basis.

Examples of Unethical Actions

In order that the reader may have some idea of the material and facts desired, I will give an instance or two which has occurred with us:

Car SAAP, No. 1381.

Ordered a car of 8, 9 and 10 foot car siding, six inches wide.

Car came loaded as follows: 21,636 feet of 9 foot, 1184 feet of 8 foot, 140 feet of 10 foot.

We had failed to specify lengths; in this we were technically at fault. The mill saw this and took advantage of us to load off onto us some $500 worth of undesirable lumber. Now, that mill knows that a nine-foot length is not suitable for either a 16-in. or a 24-in. joist—the material being used largely for flooring for barns, sheds, etc. Also for siding. Farmers do not build sheds nine feet high, but build them eight, ten, etc.

Details of One of Them

One more instance: A year or so back we ordered a car of shingles, then in transit, Aug. 25. Car was reported at Minnesota Transfer Sept. 3. Did not receive car until Dec. 1. Firm insisted they had shipped car, had it billed to us and could not be held responsible for railroad delays. I went to some expense and ascertained this car had arrived at the Transfer, as claimed, had been unloaded and piled with other shingles, that the car itself, on Sept. 5, empty returned to the coast. Another car was not provided until late in November, and it is altogether probable we never did receive the shingles actually bought. Loss of trade and disappointment of customers, and the buying of other shingles was made necessary. Shingles were on the decline that summer and fall, and the result was invoiced shingles Jan. 1 at a loss, having several cars on hand.

Where the Error Occurred

The error here was in not telling us the car was unloaded at the Transfer, and, in short, acquainting us with the actual facts instead of writing letter after letter concealing the facts. We refused to pay for the car until it was received, notwithstanding the terms, and was threatened with suit.

Send me your complaints and I will carefully compile them and present them to the wholesale associations for their consideration. It will help. I know that the manufacturers' associations are desirous of helping the trade, as evidenced by the Southern Pine Association's action last year in inviting representative retailers to New Orleans to assist in revising the grading rules, etc.

Don't wait to send in your reports, but do it now. Send to C. E. Davidson, Greenville, Ill.

Economy of Motor Trucks for Haulage

Much has been said about the economic factor in the use of motor trucks as opposed to animal transportation, but little has been shown in the way of specific instances where savings have been wrought through the use of the power wagon.

In an investigation conducted by the Federal Motor Truck Company at Bennington, Vt., it was found that H. W. Meyers & Son, dealers in coal and feed, have been effecting a saving of $11 a day in employing a two-ton Federal truck for making their deliveries.

This information was gained through accurate records of horse and truck operations covering a period of six months. It was further shown by these records that the Federal two-ton truck had performed 350 per cent more work than any of the firm's teams on the same type of deliveries. This has been accomplished at an additional cost of but 20 per cent over the expense of two horses.

A Few Details of Cost

Taking these figures as a basis a two-ton truck performs the work of 3½ teams. The cost of the horses is figured at $178.13 a month, or $5.93 per day. Three and a half teams would cost $20.77 per day. The monthly cost of truck operation is put at $213.17 or $7.10 per day. Even including the wages of a helper on the truck this form of transportation would be $11 a day cheaper than by the use of teams for the same work.

Figures submitted by the American Woolen Company show that this concern was enabled to cut its delivery costs considerably through the substitution of motor power for horses. Horse haulage costs this company $.70 per ton compared with an average of $.34 per ton for motor haulage, a saving of fifty per cent. These figures, however, do not include costs of depreciation, insurance or interest. By adding these costs to the motor truck operation alone, the power vehicle will still show a saving of $.12 per ton.

What a Horse Consumes

Extensive research among teamsters and municipal experts show that each heavy draft horse consumes 5½ tons of hay and 180 bushels of oats every year. Continuing along this line of investigation, the number of acres required to feed each horse was determined. The amount of grain this would grow and the number of loaves of bread that could be produced from the flour thus obtained were also shown. It was a notable fact that the elimination of the horse as an element in commercial haulage would effect a great economy in the conduct of the world's business besides marking a distinct forward step in the advancement of our industrial life.

A publicity campaign to stimulate building operations regardless of the present prices of materials and the general retrenchment policies of individuals on account of the war is about being launched by the building trades of Louisville, Ky.

Getting Your Building Materials Business Into Motion Pictures

The Stock "Ad" Film—Making Your Own "Movies"—Some Interesting Figures of Cost

By Ernest A. Dench

THE stock slide is popular because it is cheap. It does not look cheap, however, which is equally as important. To the public it appears that you have spared no pains or expense to present an artistic and attractive announcement, and so they are favorably impressed.

But the slide has one shortcoming—it does not move. It is a serious defect because spectators, save for the brief intermission, have a succession of rapidly moving pictures passed before their eyes. In the entertainment field the stereopticon lecture has given way to the motion picture, and advertising at the photoplay theater is passing through the same stage of development, although there will always be a legitimate place for the slide on the screen. The building materials dealer should follow in the steps of the national advertiser and employ advertising films. But not on the same extensive scale. A national advertiser thinks nothing of having a one-reel subject, taking about fifteen minutes to run off, produced at a cost of from $1,500 to $3,000. Unless it is done on a large scale motion picture producing is costly. The more theaters in which a film can be shown, the less the cost of production. But the building materials dealer is necessarily limited to one or more of the local theaters.

Here is a scheme of advertising a business which should appeal to the popular taste. Moving pictures are all the rage at present, and there is no reason why the dealer in building materials should not utilize them in showing the public just what he is doing in a business way. The plan should prove helpful in securing additional contracts for materials and at the same time increase his profits. The initial cost is not prohibitive and the results of a judicious campaign should demonstrate the wisdom of the scheme outlined by the author.

Length of "Film" Desirable

You want a film which will occupy the screen for the same duration as the slide, but no longer. From forty to sixty feet is just about right, and to have a subject of this length produced to conform with your individual requirements would cost about 50 cents a foot. If you have been accustomed to paying from 35 cents to a dollar for the stock slide, the outlay is enough to frighten you away, but the stock film has been made a practical possibility, bringing the advertising film within reach of every building materials dealer, large or small.

Those motion picture advertising producers which are making a specialty of this effective form of advertising have not confined themselves to one particular kind of production—they have taken their cue from the regular motion picture producers, aiming at variety and novelty and adopting their methods on a miniature scale. The average stock film costs from $4 to $5.

Perhaps the most popular and least expensive is the animated cartoon. A clever subject employed by one building materials dealer showed an ocean liner which is chased by a submarine and finally torpedoed. The explosion sends letters scattering in all directions, after which they arrange themselves into the advertisement. Then the steamer disappears below the surface.

Another pictured such articles as boards, laths, bricks, shingles, lime and sacks of cement flying about on the screen. They form themselves into a house out of which letters appear forming the "ad."

The stock film certainly costs more than the stock slide, but audiences evince greater interest in the former because it offers genuine entertainment without the advertising element forcing itself to the front.

Have Your Own "News" Film

The live photoplay exhibitor is deeply conscious of the fact that the national animated newspaper has its shortcomings, especially if he is located in a small town. Folks in Clayville are not so interested in Van Troopen laying a foundation stone in New York City as they are in John Brown opening the Clayville library. Maybe some local manufacturer has had an addition made to his plant and you have supplied some of the building materials. Here you have an event with a legitimate news interest. In putting over the press agency stunt you would have the exhibitor send a cameraman around to cover the event. But that would not benefit you any. The theater man, as likely as not, would leave your premises out of his calculation, and for you to profit thereby it would be necessary to have a few feet of film showing the building materials leaving

your establishment or arriving at the plant. So, to put this stunt over you must defray the cost of it. Some exhibitors have their own cameras; others hire a local cinematographer; but the arrangements in either case practically amount to the same. A useful and not too expensive length is 50 ft.

If Mrs. Brown, the well-known suffragist, sent you a testimonial in regard to the garage she had built, the first thing that would occur to you would be to have the letter flashed upon the screen. That's far too crude. But you can film an interview with your worthy customer and introduce some intimate scenes, not to forget the visualized testimonial. This would produce an exquisite blend of entertainment and advertising.

Action Should Tell the Story

All in all, it is action by which you have to tell your story. A whole mass of explanatory matter tagged onto the film hinders it instead of adding further enlightenment, as is intended. The fewer and shorter the sub-titles are the better the picture will be. There are plenty of other places in which to display how well you can weave words, so why drag them into a place where they do not fit? Besides, it is what the spectator sees, not reads, that leaves the lasting impression, which is the paramount point to be reached in motion picture advertising. Moreover, each word used means 1 ft. of film.

The motion picture photographer usually charges 50 cents a foot for producing films along the foregoing lines. By offering the exhibitor a news event film he will gladly snap it up as a special attraction. And such publicity as you will receive will not be forgotten in a day.

Why Not a Miniature Photoplay?

The advertising film writer has arrived. And none too soon. He brings with him the training acquired in writing photoplays for purely entertainment purposes. To this he has added the knack of injecting the right proportion of selling talk into an interesting story, a combination which ably equips him for his job.

Suppose you have a short photoplay written around your building materials business. You either leave all the details in the hands of an industrial producer, paying him accordingly, or else hire a regular photoplay author. In the latter event you only pay for the story in synopsis form, because only the producer can prepare a perfect technical scenario, unless, of course, the writer is attached to the staff and is acquainted with the studio facilities.

Anyone who has had a scenario produced can tell of the liberties taken with it by the director. Some of these alterations are justified; some are not. It depends entirely on the director. He may have such a conceited idea of his own importance that everything which does not correspond with his views is wrong.

Method of Procedure

I would be sorry to see such a condition come to pass in the advertising film field, so whenever you have a local film produced agree on the story, and then if it is at all necessary to alter it afterwards ask the director for his reasons for so doing. If they are sound ones, he will be able to give them, in which case you can sanction your approval. Being on the inside, I have seen the publicity properties of many a commercial film impaired because of unnecessary changes on the part of the director, so giving him a free hand without personal supervision is not to be recommended.

The cost of producing a photoplay varies from $1 to $3 a foot. Steer clear of interior scenes, as they are expensive. A photoplay may seem costly, but it is not, for it is always available and possesses exceptional business-pulling properties.

Making Your Own Movies

It has been rightly claimed that the motion picture is a permanent advertisement, but that, like most other things, is apt to become stale and out of date through constant repetition. Not a few advertisers have had a big splash at motion picture advertising and have then retired. Far better had they concentrated on a library of short subjects and thus kept up to date; the cost would have been no greater, if as much.

Invariably outside assistance has been called in, but this has been found to have its advantages. How convenient it is to take your own movies, or else entrust the work to some competent person you know to take advantage of the opportunities as they occur. It is cheaper, too, in the long run.

The cost of a reliable camera for all-round work varies from $35 to $110. The purchase of the right camera at the beginning is very important, and from a comparison of those designed for amateur use I would recommend the "Alamo" as being the best. It holds but 50 ft. of film, thereby reducing the possibility of negative waste to a minimum, weighs but five pounds against a hundred-pound professional model, while the lens is satisfactory under all conditions.

Cost of Films

Raw film, both negative and positive, is obtainable in reels of 100, 200 and 400 ft., at 3¾ cents a foot. A motion picture film has to survive so much wear and tear at the hands of different theater operators that, in order to preserve a perfect appearance as long as possible it should be printed upon a reliable stock. Most of the regular producers use Eastman, so it is best to specify this particular kind.

The motion picture camera only differs from the ordinary camera in that machinery controls the shutter. By turning the crank, the shutter opens and closes in turn. At each turn of the crank eight frames, each of which is 1 in. wide and ¾ in. in height, are exposed.

As the standard speed is sixteen "frames" a second, the crank must not be turned more than twice a second. With watch in hand, it is easy to adjust this speed, and also to know how much film has been consumed. Unless this detail is attended to from start to finish, there will be a decided

jerkiness in the result. The knack of obtaining an evenly balanced scene is to watch the view-finder while turning the crank.

For taking interior scenes, where the light is probably not strong enough for photographic purposes, the Panchrome arc lamp cannot be excelled. The lamp, which may be rented or purchased outright, contains two arcs which require 15 amperes at 100 volts, giving forth 8,000 candle-power. The lamp is easily connected, as it is self-contained, with collapsible reflector, necessary resistance wires, etc., and produces a varied range of colors and shadows.

Now let us go into the cost aspects. Going on the assumption that the first effort totals 250 ft., or a one-quarter reel, and this has taken one day to produce, the production expenses should be about as follows:

Camera man, at $8 a day	$8
Raw negative stock	10
Raw positive stock	8
Developing and printing	15
Camera	50
Incidentals	15
	$106

Were you to obtain an estimate from the industrial producer covering an industrialog of the same length he would probably quote $100, yet $6 more includes the initial outlay. It is therefore easy to perceive that after you have produced several pictures a considerable saving is effected.

Developing is best entrusted to one of the many plants having the proper facilities for doing this work. Usually 5½ cents a foot is charged for positives and ½ cent for negatives. Any titles—explanatory matter—that you may wish to use will cost you 5 cents a foot.

Getting the Circulation

The negative, we will say, costs $100, with $8 additional for every print. Now, if you intend having your film shown simultaneously at a number of theaters, it means that you will have to supply one print for each. As the picture will only be retained for several days, it is extremely doubtful whether the expense will be justified, so it is best to utilize but one print over a given territory. The life of a print depends on the care taken by the operator—it may only last three weeks in a serviceable condition or it may be excellent after six months in use.

A quarter reel picture occupies the screen for four or five minutes, and the exhibitor charges from $2.50 to $10 a week for screening. A motion picture film, I admit, represents a substantial outlay, but it is a worth-while investment.

Locating a Retail Building Material Plant

By L. R. Putman

Here is a discussion of one of the fundamental problems of building material merchandising that smashes a lot of moldy tradition. Perhaps it has a bearing on the possibilities of your business. Anyhow, it will be worth your while to read it—to attempt to apply it to your own situation.

THERE has been more science injected into the business of merchandising during the past twenty years than there was during the full two hundred years preceding Luck is an obsolete word so far as success or failure is concerned. A definite reason can and is applied to every rise or fall of any business enterprise.

Elbert Hubbard spoke the truth when he made a statement to the effect that the public will make a beaten path to the door of any man who can do a thing better than any one else, although that man's house may be in the woods. But, there is always some one to dispute the title of supremacy. For that reason even if a man can excel in any pursuit or the manufacture of any article, nowadays he isn't satisfied to leave it to the public to create the demand or the desire for the result of his labors.

The location of his place of business is the first important question which confronts a man who has the money and the desire to sell building materials at retail. There was a time when the supply was so limited and the demand so great that it was left to the buyer to be the aggressor. Not so to-day; the man who attempts to wait for business to come to him unsolicited will wait in vain.

Soliciting, or in other words, advertising, may be done in a great many different ways. Some of the best and most effective advertising in the world is done in properly locating a place of business. On one or more occasions I have heard it suggested that some of the best known five- and ten-cent stores do very little advertising such as buying newspaper space and other ordinary forms of publicity. As a matter of fact these stores do spend large sums of money in the usual ways of advertising, but in the first place they are willing to make any outlay of money necessary to secure the very best location in any city in which they have sufficient confidence to make an investment. At different times the owners of these small-price stores have been known to re-

fuse to open stores in certain cities until they were able to secure the locations which the proprietors believed to be the most desirable. When these particular choice locations have been determined upon, the price to be paid for them is of secondary consideration.

Choosing a Site

Long before negotiations for a location are begun a careful survey is made by experts. Every advantage is considered. The commercial value of space in any community, great or small, is determined by its accessibility to the public. Then, the future tendency of the growth of the town with relation to the location under consideration must be kept in mind. Centers of trade shift with the growth and development of the town. As a rule these five- and ten-cent stores or any other of the most prosperous retail stores will be found where the greatest number of people are known to pass. The usual manner of determining the value of a retail location is to base it upon the number of people who walk past it

"The location of his place of business is the FIRST important question that confronts a man who has the money and the desire to sell building materials at retail!" In other words, the fact that a railroad siding can be had at a certain point "down in the hollow" or "over on the other side of the tracks" is no reason at all for locating your yard in that absurdly inaccessible place. So reasons Mr. Putman out of a wealth of successful experience as a retail lumberman.

in a given time. Naturally, the more people who walk in front of a man's store, the more opportunities that man has of making sales.

The First Requirement of Success

The first requirement is to have the customers pass your doors; the next is to have them enter, and the next, to have them buy. The most that advertising can do so far as the store is concerned is to bring the people to it. The business thus secured depends largely upon the selling force.

Now, with a retail building material business such a location as is usually selected by the owner of a five- and ten-cent store is entirely out of the question. Building materials, and especially lumber, are very bulky. It is impossible for the customers to carry the goods home, and it is unnecessary and impractical to display the goods as are displayed novelties, notions or even clothing, which are sold finished and ready for use. With these things in view, the price of the location for a retail building material store or yard depends upon the volume of trade which it is estimated the business will command.

Leasing vs. Owning Property

Some concerns think it advisable to rent or to lease a location rather than to own and to improve the property. Leasing seems to be more common in the West because of the reason that the future of a great many new towns is indeterminate, and in some instances towns which begin with flattering prospects in a few years fell away in business and brought the owners of real estate loss in values. This condition has caused the reduction in the number of lumber yards in a great many towns. During the boom times of some of the new towns, particularly in Oklahoma, as many as twenty lumber yards prospered for years, while to-day five or six of them find it very hard to show dividends equal to the regular rate of interest.

Foundation of All Prosperity

In a general way the prosperity of any community depends largely upon the agricultural interests surrounding it. No prosperity can be more solid or dependable than that which comes from a good, rich soil tilled by an energetic class of farmers. Which town in that section prospers most, depends upon the class of merchants attracted to the different towns. Some towns lay dormant and refuse to grow while others nearby flourish and spread out. A careful investigation will usually show that the foresight and co-operative energy of the merchants in the prosperous towns has attracted a desirable class of citizens.

Neighbors Cannot Be Ignored

Some merchants imagine that they can be successful regardless of their neighbors. That is a great mistake. A few business failures in any town soon reflect results in the business of all the other concerns. Business men are truly their brothers' keepers. It is to the interests of every merchant that every other merchant is a good merchant. Business is naturally attracted to the best merchant and the more good merchants in any town the more business is to be had in that town.

I have seen the personnel of the business men change in a town, and with the change of men came a change in the prosperity of the town.

Business Is Built on Confidence

Business is built upon confidence, and a few merchants who fail to get the confidence of the people injure the whole commercial atmosphere of the community. This is most forcibly brought out by a bank failure in a community. It is a well-known fact that immediately after a bank failure the confidence of the people in banks is weakened and they begin to hide their savings about their homes, rather than to risk putting their money in the banks. Bankers know this and it is the custom for bankers to go to great extremes rather than have a bank failure in the neighborhood. It would be poor judgment to open a building material business in a town where the merchants are poor merchants or where the citizens do not have confidence in the local institutions.

Another mistake is made by some merchants in not taking a true estimate of the volume of busi-

ness any town will support. It is much better judgment to pay a premium for a concern already established than to go into a community on a cheaper basis, but where the volume of trade will not justify the increased investment and overhead expense. Too many lumber yards in a town are a hindrance to the town. If they are losing money the business of the town is hurt. If they make money they must charge unreasonably high prices for their goods.

A building material plant or lumber yard of to-day in a fairly good sized town represents a very much greater investment than it did fifteen or twenty years ago. That is the case even if nothing but the same lines are carried; but the lumber dealer of to-day is not satisfied to sell nothing but lumber or wood products as he formerly did. He finds that his selling expense is but little more after he has equipped his stock to handle the complete material bill for most any sort of a building.

Before establishing a store the United Cigar Stores Company has an accurate count of the number of pedestrians passing the proposed site. If the traffic is heavy enough the store will pay. The same principle is followed in selecting sites for Childs' restaurants. And these two concerns are merely a little better known than thousands of other retail business houses that are capitalizing ACCESSIBILITY. Why should any merchant HIDE and expect prospective customers to seek him?

A Lumber Yard Is a Department Store

On this hypothesis the modern lumber yard is not simply a place where wood products are kept but a department store where may be found every kind of building material. In most cases where the business is in the hands of a real merchant, this kind of store is more convenient and attractive to the contractor or builder of a new house than the old fashioned one and the plan of buying part from one merchant and part from another. Some of the talking points are that the bill is all figured in one estimate, that the account is all kept on one set of books, that the delivering is cheaper where it is done by the merchant and more convenient than where done by the purchaser. The modern system is more in keeping with the present idea of conservation and efficiency. It causes much less lost motion.

Arrangement of Modern vs. Old Building Material Plant

The modern building material plant requires a different arrangement of buildings and equipment from the old. Something more than a lumber shed is required. Some of the up-to-date lumber yards are beautifully arranged and kept. Show windows, show cases and display racks are to be found nowadays in most every lumber yard; the most modern addition is known as a "service department." In this room or department are kept samples of practically everything the dealer sells. Many sales are made in this way which would not otherwise be thought of by the customer. An attractive mantle can often be added to the lumber bill if it is in sight and the customer or his wife sees it neatly displayed in the service room. A great many suggestions and much information can be brought forcibly to the attention of a prospective purchaser by properly arranging a service room. To the ordinary home-builder a blueprint or a picture does not mean nearly so much as the real object itself.

The drawing or the picture of a door or a china closet or a colonnade does not have the effect or make the impression or create the desire to buy as do these things themselves when tastily and properly displayed.

The Part Being Taken by the Women

The present political situation should conclusively prove to the minds of all men who handle building materials that the women folks are taking an active hand in the affairs of the world to-day more than ever before. It is quite often the case that the building of a new home is left largely in the hands of its mistress. There are several good and practical reasons for such an arrangement. In the first place, the woman does or should spend more time in the house than her husband. It is her duty and most always her pleasure to keep the inside of the home in order. She is usually a closer observer in such matters and nearly always has better taste than her husband. Another mighty good reason, from the husband's standpoint, is that he will not have to go to bed and to get up listening to the disagreeable phrase "I told you so!"

How much business is your community capable of producing for you? Have you ever attempted a careful analysis? Could you help your Commercial Club bring some new industries to your town? Are you doing your part in all such community welfare work? It pays to remember that you can not always collect your dividends the same day you make your investment. Industries bring people who require dwellings for which you can sell the material. Are you doing the necessary promotion work?

Then there is the omnipresent and conclusive reason why the woman should have the last say about the home and that is "just because." For these various and sundry reasons, as well as several others, the women should be considered in the final location of a building material plant in an ordinary town.

Some Suggestions for the Dealer's Homecraft Department

How Short Length Lumber Can Be Utilized to Advantage

By W. S. Wilkin

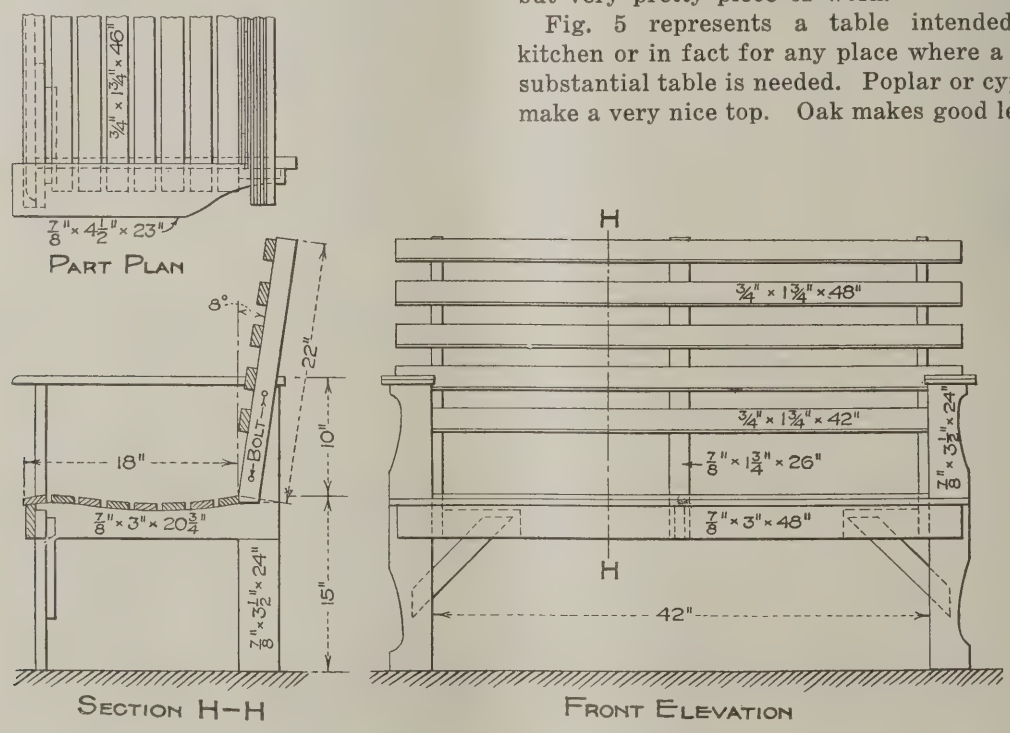
The drawings and descriptive particulars which are herewith presented relate to several articles which almost any carpenter should be able to make with very little trouble. Fig. 1 represents the front view of a neat lawn seat, while Fig. 2 is a section and Fig. 3 a part plan.

It will be seen that there is nothing in this seat thicker than ⅞ in., so that it can be made from boards and all nailed together with the exception of the back of the seat, which is fastened on to the back legs by means of four ¼-in. bolts.

If made from pine or cypress, the seat and back slats help to carry the weight. The seat may be made anywhere from 36 in. to 56 in. long and the back may be from 20 in. to 28 in. high. If the mechanic has no band saw or jig saw, the seat may be flat. Braces to the front legs will stiffen the seat and keep it from racking. In doing work of this kind, one can often use a few sound knots or little worm holes and they will not show much after the work is painted.

In Fig. 4 is represented something that can be made from scraps of lumber and is very convenient to serve as a rest for a flower pot. It can be made from either hard or soft wood according to convenience. Halve the two cross pieces together, screw the legs on with round-head blued screws and stain it dark. The result is a cheap, but very pretty piece of work.

Fig. 5 represents a table intended for the kitchen or in fact for any place where a plain but substantial table is needed. Poplar or cypress will make a very nice top. Oak makes good legs on ac-



Figs. 1, 2 and 3—Various Details of a Convenient Seat for the Lawn—Scale ¾ in. to the Foot

slats should be about ⅞ in., but there are often short pieces of 2 x 4 or 2 x 6 in. oak about 4 ft. or 5 ft. long from which these slats can be ripped. If they are made of oak, ¾ in. or even ⅝ in. is thick enough for that.

The seat should be reinforced about every 20 in. or 24 in. to keep the slats from springing, as shown. In this way the front piece and the back

count of holding screws well. A table like this can be made any size to suit the owner, but the standard height for a table is about 30 in. If casters are used on the legs, the latter must be made shorter. I have shown this table 2 x 3 ft. 6 in. which affords the reader a good idea of the proportion of the width to the length.

It will be noted that the underside boards are

only about 1½ in. from the side while they are about 2½ in. from the end. If you get too far from the sides, the top will be easier to split off and then it might curl up a little at the edges. Some time ago we made a table like this, 43 in. wide to fit up to another table. It was 6 ft. long and we used 4 in. boards around the legs. The legs were 2⅝ in. at the top and tapered to 1½ in. We made a cypress top and oak legs with ball bearing casters.

Fig. 6 shows how we fastened the top in place. With a gauge we cut out a place in the rail boards and run the screw up into the top, then put several screws across the end to hold the top flat but they need not be so close together on the side.

Fig. 7 shows a good method of fastening to the legs. It will be seen that the side board is cut out at the end and the end board fits into this which makes a stiffer joint than the miter or a plain butt joint.

Fig. 8 shows how to taper the legs. Take the board *a* and make *c-d* equal the amount you want to take off the bottom of the leg. Make *c-e* equal the distance from the bottom of the leg to the top of the taper, then rip off the board on the line *d-e* and nail the block *f* on to stop the leg. The leg is shown in place with the rip at *b*. Place the top of the leg toward the saw and move the fence back till the saw will start in at the right place, then push the board and all through. Taper two sides this way, keeping the straight side of the leg against the board. Then make a new board by cutting off just twice as much as you did from this, or re-cut this by making *d-g* equal to *c-d* and rip from *g-e*, then taper the other two sides of the legs, keeping the tapered sides next to the board this time.

In Fig. 9 is shown a substantial little stool which can be made of short lengths of lumber and

Cutting Bills for

Lawn Seat							Paint
Pieces	Thickness	Width	Length Ft.	Length In.	Grade	Kind of Wood	
4	⅞	3½	2	0	Good	Oak	Legs, band saw.
2	.....	3	..	20¾	.....	.....	Seat end.
1	.....	.....	1	5½	Com.	Any kind	Center.
1	.....	3	4	0	Good	Oak	Front.
2	.....	4½	1	11	.....	.....	Arms, band saw.
1	.....	1¾	2	1½	.....	.....	Center back.
2	.....	.....	1	11	.....	.....	Ends for back.
2	.....	2	1	0	.....	.....	Braces.
2	.....	2½	..	7	Com.	Any kind	Blocks.
1	¾	1¾	4	1	Good	Oak	Front seat slat.
4	.....	.....	4	0	.....	.....	Back slats.
7	.....	.....	3	10	.....	.....	Seat.
1	.....	.....	3	6	.....	.....	Back.

Flower Stand							Stain
1	⅞	10	..	10	No. 1	Y. Pine	Top.
4	.....	2	1	6	.....	.....	Legs.
2	.....	2	..	10	.....	.....	Cross braces.

Kitchen Table							Paint
1	.....	24	3	6	No. 1	Cyp.	Table top, glue up.
2	.....	3	3	1	.....	.....	Side rails.
2	.....	.....	1	9	.....	.....	End.
4	2	2	2	5	.....	Oak	Legs, taper.

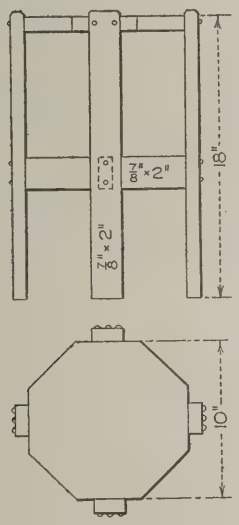


Fig. 4—Stand for Flower Pot—Scale 1 In. to the Foot

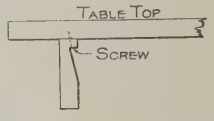


Fig. 6—Showing How Table Top is Fastened

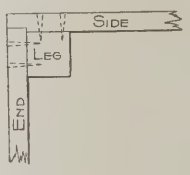


Fig. 7—Method of Fastening the Legs

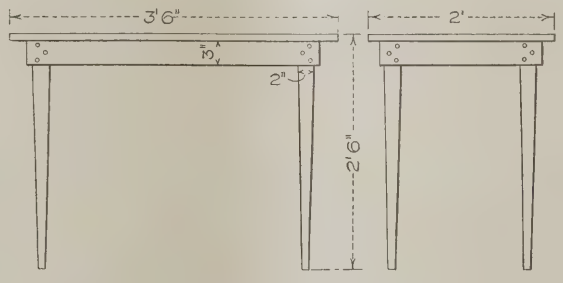


Fig. 5—Side and End Elevations of Kitchen Table—Scale ½ in. to the Foot

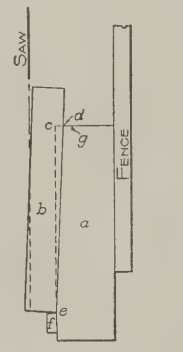


Fig. 8—Method of Tapering the Legs

Details of Various Articles Utilizing Short Length Lumber

Small Heavy Stool							Paint
1	1⅛	9	1	0	Good	Poplar	Top.
2	1⅛	8½	..	7	.....	.....	Legs.
2	⅝	2½	1	0	.....	.....	Sides.

Book and Paper Rack							Stain and Varnish
2	⅞	13	3	1	No. 1	Oak	Band saw, can be glued up.
1	⅞	12	2	6	.....	.....	Paper shelf.
1	⅞	5⅞	2	6	.....	.....	Book rack.
1	⅞	5	2	6	.....	.....	
1	⅞	3	2	6	.....	.....	Top tie.
2	⅞	4	..	7½	.....	.....	Braces.

is just the thing to have around the house to stand on to reach the top shelf or to fix the stove pipe or to sit on to clean the shelves in the sideboard, etc. The children can use this roughly and not

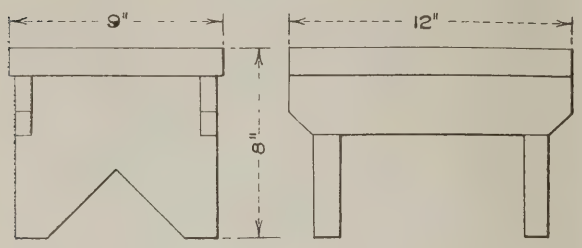


Fig. 9—End and side views of heavy stool—Scale 1½ in. to the foot

break it. I have one that my grandfather made for me about thirty-five years ago and it is just as good to-day as it was then. I have made several for children. It is better to use 1⅛ in. or heavier for the top and legs and about ¾ in. for the side boards.

This same pattern makes a good wash bench, only it should be built about 20 in. high and 18 in. wide and 24 in. to 26 in. for one tub or 48 in. to 52 in. long for two tubs. In building the stand ⅞-in. lumber is sufficiently thick.

In Fig. 10 is shown a very simple but rather odd book rack with paper shelf underneath. The books are put in with the bottom end and open edge down, making the back of the book with the title where they can be easily seen. If the rack is not full, the book can be opened in the rack and it is in a convenient position to read it if one is sitting in a low chair. For this kind of work cherry, walnut, chestnut, pine, ash and oak can

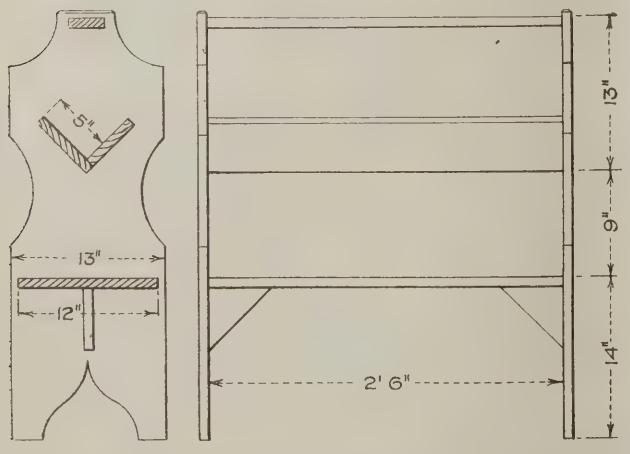


Fig. 10—A convenient book and paper rack—Scale ¾-in. to the foot

be used. For pine and oak I think a dark oak stain with Mission or early English finish. We have used two different kinds of wood in the same article, say a black walnut top and cherry legs with very good results.

The above is the cutting bill for the five articles shown in the drawings accompanying this article. The arrangement makes what I consider a very good form for a cutting bill. The headings and lines can be printed if any one is doing enough work of this kind to justify the expense in getting them out in this shape. The bill gives about the net length. If you are billing for some one else to cut from it, the best plan is to bill the material from ½ in. to 1 in. longer so as to give room to square up, etc. The cutter will usually make allowance in the width when it is to be glued up. When there is no detail you can often make little sketches on the bill that will help explain what you want.

Where I have marked "Paint," "Stain," "Oak," "Poplar," etc., on the bill it is merely as a suggestion just to show how they can be marked on the bill to help the cutter when the mechanic is not cutting the work himself.

Building Materials for Europe

Many reasons are assigned as a cause for the present high cost of building materials of all kinds but a most cogent one is undoubtedly the options which have been taken on vast amounts of supplies by interests who plan to ship millions of dollars worth of building materials to Europe just as soon as the war is brought to an end.

It is stated that some of the interested companies are sufficiently well equipped to take orders for factory buildings as large as 90 by 300 ft., and to supply in the same shipment enough dwellings to house the necessary hands to operate the mills. Inquiries have been sent here from England, Russia and France, seeking to ascertain the cost per cubic foot of American standard shaped industrial buildings and quickly assembled houses for the employes.

According to the specifications received from France "prices must include complete mill construction, ready for setting machinery on floors within thirty days from arrival of material on site, quotations to be free on board, New York, and cover purchaser into the summer of 1918."

One New York company is said to have already made shipments of houses of this sort into South America, and is taking on capacity to meet the requirements of an export business in all kinds of basic building materials which seems sure to develop upon the closing of hostilities.

According to W. J. Haynen, production officer of the Emergency Fleet Corporation, 375,000,000 to 400,000,000 ft. of Southern yellow pine timbers will be needed within the next twelve months to complete the wooden shipbuilding program of the Government. It is stated that yellow-pine manufacturers are now cutting and shipping between 500,000 and 600,000 ft. of ship timbers daily, but this is little more than half the requirement. As a result of the scarcity of materials at present arriving at shipbuilding points, many yards are said to be wholly or partially idle. Two hundred and fifty wooden hulls are under construction.

Relations Existing Between the Dealer and the Building Contractor

Telling How Both Dealer and Contractor Can Make Money—Bunch All Deliveries

By "The Old Retailer"

THE retail dealer may often have occasion to think of the contractor as the old country bachelor did of the women folks: "We can't get along with them, but we can't get along without them." And it is so that both of these factors are essential in the building business, for, to a considerable degree, they depend one on the other. Therefore, it would seem in accordance with common sense that whatever might be discordant in their relations should be harmonized as nearly as possible. Both live in the same town and both are directly interested in the same business. What injures one injures the other; and, likewise, what helps the one benefits the other. These truths are obvious, but, like others of similar character in human relations, they are ignored or forgotten under the influence of individual selfishness.

In this further discussion of the subject some strong points are brought out.

Among other things it is suggested that the contractor make few separate orders so that the dealer may bunch all deliveries and thus save time and trouble.

How both dealer and building contractor can make money.

Bringing dealer and contractor into closer relationship.

Various ways in which the dealer may be of real service to the building contractor.

Dealer should have a thorough understanding with small contractors before extending them credit.

All bills should be promptly paid when due.

The most successful dealers are those who have the contractors working with them instead of having their influence exerted against them. Even the tricky and unreliable contractor will give his preference to the dealer who gives him a square deal, though the dealer may watch him and hold him strictly to his agreed obligations. This dealer's prices may not be the lowest, but he gives the quality and service—and to a contractor service means more than it does to any other class of lumber buyer, for he is, so to speak, an every-day customer, while the rest of the dealer's customers are only occasional buyers.

If the contractor be of the reliable class, he should be considered and treated as a preferred customer. This preference, however, should not be permitted to pass the bounds of legitimate service. The contractor should be made to understand that this does not include the giving of excessive rebates or unlimited credit and freedom to pay his bills when he pleases. Some contractors get the idea that because they are giving most of their business to a dealer, he is under obligations to let them do as they please in the matter of credits. This leeway, if given them, frequently permits them to go beyond their depth, with unpleasant results to them as well as to the dealer. Moderation, therefore, in the preference given a good customer has the beneficial effect on saving him from financial trouble.

When a contractor takes a job, he usually has a time limit wherein to complete it. It is necessary, therefore, that he shall have the co-operation of the dealer in preventing delay in the furnishing of material. The dealer should make an extra effort, if necessary, to see to it that the workmen on the job do not run out of material. This may be considered the business of the contractor, but the dealer's part is in delivering promptly when the stuff is ordered and thus assisting in keeping the work moving on the job. This is a part of good service which the contractor appreciates.

If the dealer has not all of the material for a bill in stock, he should be frank to tell this to the contractor and the time when he expects to have it in, so that the contractor may make his plans accordingly. It is a poor plan to sell a man what you haven't in stock and not to let him know it at the time, for it is liable to work him an injury that he won't forget when figuring on the next bill.

The contractor can co-operate with the dealer in many ways to mutual advantage. But it is up to the dealer to educate him in those ways that will accomplish such co-operation, for he is not liable to acquire them of his own volition.

In the matter of delivery, a contractor can save the dealer a good deal of unnecessary work and valuable time by making as few separate orders as possible. You all know what it is to get an order for quick delivery of a few pieces of stuff to a job and half an hour afterward to receive another order for a few boards or a couple of bunches of shingles for the same job. They want it at once,

but your teams are busy on other deliveries or the drayman is not to be had. So the urgent delivery has to wait; whereas, a little though on the part of the contractor would have included these two orders in one.

I have known of contractors placing the order for material to be sent to a repair job just about the time the workmen got there. Then the latter had to wait until they got the material before work could be commenced. At the wage rate of 70 cents an hour this was a loss to the contractor. The dealer had to bear the blame, of course, for poor service.

How Annoyances May Be Avoided

A good deal of this annoyance may be avoided if, as before mentioned, the dealer will take the pains to educate the contractor to place his orders so as to "bunch" the deliveries and to give him a reasonable time to get the material on the job. This gives an opportunity for the good service which each party wants to give or to receive.

I have spoken at another time about the small contractors and their liability to take work at such low figures as will not clear them on the job. They may be good workmen and do a satisfactory job for the owner; but sometimes they do not possess the business ability to figure and to carry on their work to the satisfaction of the dealers who are selling them the material for their jobs.

Service the Dealer Can Render the Contractor

Among this class of contractors are many who are honest, well-meaning men who want to pay their bills. And if a dealer is wise, he can make a choice of these men and render them a substantial service by co-operating with them in such a way that both will make money in these relations. It can be done in this manner: Choose the man who you know by experience is honest and intends to meet his bills; give him distinctly to understand that you are willing to give him credit to a certain limit on certain conditions. These conditions are that he shall not undertake a job for any man before he lets you know who the party is, so that you can look him up and find out if he is reliable. Also, to take no job unless at a fair, remunerative price; but he must consult you before taking the job, so that you can judge whether it is a fair price or not, and the terms on which it is taken. Further, that he must make payments for the material at the time he receives his money from the owner and must pay for all when the job is completed and settlement had with the party for whom he is doing the work.

A Combination for Profit

The idea of all this is a combination for profit for both. The dealer furnishes the material at fair prices. The cost of the bill being known to the contractor, he can get his prices for his work and percentage on other labor; and at the end he is not in debt for any of his material. Another thing: The greater part of the business these men do is repair jobs, and frequently no contract is made for the whole job. The work is done by the day but the whole thing is under the superintendence of the contractor and he sees to buying the material as well as collecting the money.

Co-operation That Is Advantageous to the Dealer

It is obvious that such a scheme of co-operation can not be otherwise than advantageous to the dealer, who has in this way a practically non-competitive business. This plan is a practical one, and no mere theory, because the writer has been using it for many years. He picked out his men and trained them to do the things he has mentioned They too found it was to their best interest and stuck to the requirements.

I want to emphasize this class of service, because it has more to do with bringing the dealer and his contractors into closer and more harmonious relations than anything else; for when a man sees that you are doing things in his interest he will reciprocate by working for your interests. In this it is essential that each is fair and square with the other.

Attitude of Some of the Smaller Contractors

Of course there are some among this class of small contractors who are unwilling to place themselves under these restrictions, and therefore it is not best to tie up with them. Sooner or later these men run themselves out of business and those that are working with the dealer will continue on and get the business because they become known as reliable men who do good work and pay their bills.

The foregoing has referred chiefly to the furnishing of lumber bills, but the majority of lumber dealers handle other building materials besides lumber and usually they are the only ones in town who carry such materials in stock. This brings the dealer into relation with other workmen in the building trades, and nearly every one of them contracts to furnish materials as well as to do the work. And like the small contracting carpenters, there is close competition among them for a job. Usually the quantity of material is small and where the jobs are infrequent the temptation is strong to collect the money and use it for personal needs. They, therefore, require close watching on the part of the dealer to prevent this. And when he finds a customer of this class doing this it is best to shut off giving him credit and require him to collect the money and pay for the material before it goes from the yard; or else get from him an order on the owner for the amount and have the owner accept it before the delivery.

Extending Credit to Them

In extending credit to these small contractors of uncertain stability it is always best to have an understanding with them that you will limit their credit to a certain amount and when that is reached they must collect their bills and pay up before getting any more. This is really doing them a service for these small jobbing mechanics are generally poor collectors because they fear it will injure their chances for work if they push for their money. This feeling is not confined to them, however; for it also

actuates the dealer himself to his attitude toward those owing him accounts.

Restricting Small Accounts

This policy of restricting small accounts will actually work to bring more business to the dealer, for this reason: If you permit one of them to go on and to get what he wants and to pay when he can, there comes a time when you think he has gone far enough and you get after him for a settlement Then you find, perhaps, that he has collected most of what is owing him and appropriated it for his own living necessities. In pressing him for the account, he goes somewhere else for his material and you lose his trade. On the other hand, if you make him give you prompt settlements he will continue to give you his trade, because if treated well he has no particular incentive to go anywhere else.

Small Jobbers Should Be Encouraged

Any man whose business is worth having will soon realize the worth to him of your insisting on settlement promptly, as he collects for his jobs. These small jobbers in the trades are worth looking after and cultivating for their business, for it is not only what they buy of you but also the value of their good will and influence that counts. For every man has his own circle of influence, be it large or small.

One Way in Which Dealer is of Service to the Builder

Another thing in the way of being of service to the contractor is the furnishing of a separate room in the lumber yard office for him to use in drawing his plans and making his estimates. A set of drafting instruments and paper, with other things in the line of stationery, may be furnished for his convenience, together with a collection of architectural plans and reference books. I don't think it best, either, to limit the use of this room wholly to the customers of the yard. A wiser policy would be to make it free for all the mechanics in town to use if they want it. The chances are that it would be used mostly by the yard's customers, but making it free to all would remove the charge of favoritism There is no question but that a service of this kind will tend to create sort of a partnership feeling between the dealer and the contractors who trade with him, for the inference will be drawn that he is taking an interest in their welfare and desires to help them in their business, to assist them to obtain a better knowledge of it.

Effect of the Service Rendered

Every item of good service has its reciprocating effect and in this case it would operate on each contractor to be less frequent with complaints and more liberal regarding exactions. This idea of a contractors' room has been put into practice by a number of dealers throughout the country who are progressive enough to realize the business value of co-operating with the contractors. They understand the psychology of being accommodating and furnishing helpful service to a class of men whose interests are inseparable from their own, and mention is made of it here for the purpose of inducing others to follow their example; for, as has been proved with them, it will go far in solving the contractor problem. It should always be remembered that service begets service and is a good breeder of values.

Attitude in Regard to Giving Discounts

The matter of giving discounts to contractors has always been one of dispute, not only between them and the dealers but also with the dealers themselves The contractors claim that it is due them because of their being in the building trades and also because they are more continuous patrons of the yard than any other customers. Some go so far as to claim that a discount is their legitimate right and demand it accordingly and will resent any attempt at withholding it.

As a matter of theory, they are doubtless warranted in believing they are entitled to discounts. This is recognized by building material men in most of the larger cities and places where the greater part of building is done on contract. Generally there is a basic price list and the contractors are given a dollar off this list and a 2 per cent discount on their bills, besides, if paid promptly on a certain date. Some of the country dealers also are giving this or a larger discount to their prompt-paying contractors.

Dealers Averse to Giving Cash Bonus

But the majority of dealers in the country are averse to paying anything in the nature of a cash bonus to anyone for their trade. They argue that in carrying the contractors on their books and virtually furnishing them capital to carry on their businesses, they are doing all they can afford to do.

Another thing: Bills are figured for contractors very often down to a small margin above cost in order to make the sale. But of this the contractor is ignorant. All the same, he thinks he ought to have a discount when he settles for the bill. He does not understand that the dealer gave it at the time of the estimate.

New Use for the Motor Truck

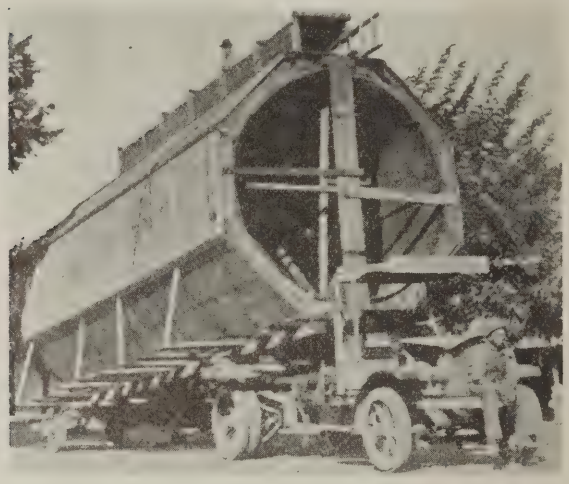
Times have changed somewhat since grandfather drove out to the saw mill with a yoke of oxen and consumed two days in hauling in enough boards to build a 12 x 12-ft. henhouse. In these days he can order it by telephone, load it on a truck the next day with several conscientious, egg-laying fowls inside, and by the time he reaches home very likely find enough fresh eggs inside to pay for the gasoline used on both trips, says a writer in a recent issue of the *Wood Worker*.

People are just beginning to learn what automobile trucks can do, and, judging by what is being accomplished at the present time, it would be either a very rash or poorly informed man who would make a positive statement as to what they can't do. Glance at the accompanying picture, for instance,

and you will get an idea of the uses they are putting the truck to out in California.

The Tuolumne Lumber Co. of Modesta, Cal., is engaged in the manufacture of silos, and as they can be built much cheaper and easier at the plant than to transport the lumber and put it together on the customer's premises, the company naturally turned to the gasoline motor as a means of transportation. In this case one of the silos was gently tipped over on the backbone of a specially prepared gasoline buggy, a few chains wrapped around its circumference to keep it from blowing away, a lookout stationed on top to lift telephone and electric wires over the periscope—and the truck disappeared over the rim of the horizon.

Somewhere out in the country the farmer who had ordered it the day before, was already fretting because of the delay in delivery. He was about ready to step into his limousine for a trip to the city when the silo came slithering up in a cloud of dust, was backed up to the foundation, slid off



Delivering silos by means of motor trucks

and the roof clapped on—and the chauffeur was off to deliver another one before dinner.

That's the way they are doing things out in California. The silo shown is 10 ft. in diameter, 35 ft. high and weighs approximately nine tons. It was moved on a White three-ton truck.

Another "Forest" Regiment Authorized

The formation of a second "Forest" regiment, comprising ten battalions and made up of lumbermen and woodworkers, who will go to France for the purpose of getting out of the forest such materials as the American, French and British armies may require, has been authorized by the War Department. Two battalions are to be raised at once with the active aid of the Forest Service of the Department of Agriculture, and it is expected that the eight remaining battalions will be called for in a short time. Nine "service" battalions made up of laborers who will be used in connection with the forest regiment have also been authorized.

In order to provide for future contingencies, it was then decided to commission at the present time enough officers for the other battalions yet to be raised. According to the present plan, 50 per cent of the officers will be saw mill and logging operators. 25 per cent will be technical foresters, and 25 per cent will be men of military training.

Each of the ten battalions of the second regiment will comprise three companies of 250 men each and will be under the command of its own major. Skilled lumberjacks, portable mill operators, tie cutters, logging teamsters, camp cooks, millwrights and charcoal burners are among the classes of men desired.

The first regiment of woodsmen numbering about 1200 men and designated as the Tenth Engineers (Forest) has already been recruited to its full strength. It is nicknamed the "Lumber Jack Regiment" and will be employed in getting out material for army use. The regiment will take with it both stationary and portable saw mills with everything necessary for logging and saw-mill work and for transporting the products.

Collecting Old Accounts

One collection letter is always reserved by our concern until every other means has failed, states a writer in *System*. In each instance that it has been used by us it has followed several statements, notices, collection letters, and promises to turn the account over to an attorney.

In all but one instance a check has come back immediately from this letter:

"Just why you have not favored us with your remittance covering your account is not quite clear to us, and your reason for not doing so may be of such a personal nature that it is none of our business. But we would appreciate learning *when* you expect to send us your check."

Quick Handling of Lumber in the Mill

From log to lumber is a rapid transformation after the log is fished from the pond, hauled up the log slip and thrown on the skid, off which it rolls on to the carriage, where it is turned into correct position by the "steam nigger," fastened on the carriage, and cut into shape and form for use by the big saws, of which there are three kinds, band, circular, and gang, a process which requires but a few minutes. Half an hour later the lumber is in the dry kiln, or, if timbers have been cut, they are waiting on the timber docks, ready for loading on freight cars.

Reports received at the offices of the Southern Pine Association show that a majority of mills are now handling the Government's war business on a six-day schedule. This is, within a week from the time a Government order is received, the trees have been cut from the forest, hauled to the mill, manufactured, kild-dried if necessary, placed on freight cars and delivered to points of destination.

"WITH reference to the fear that has been expressed in some quarters that there will be a scarcity of lumber for building purposes, I have not been able to find any basis for this in fact. It is true the mills are turning out less than their normal output. Some estimate the curtailment at 25 per cent, and some go as high as 33⅓ per cent. This is due to weather conditions and to the scarcity of efficient labor. Even should this curtailment of output continue, however, there ought to still be sufficient lumber to satisfy all requirements.

"Temporarily the mills are busy getting the lumber out for the Government work, but this rush will be over within 30 to 60 days, after which lumber can resume its normal course and will be available for general building purposes. In addition to this fact, the lumber going into the Government work is almost entirely of the lowest merchantable grades, such as box and culls, leaving for commercial consumption all of the better grades. For ordinary building purposes there is required a large percentage of No. 1, No. 2 and No. 3 lumber, so that even at present there is plenty of this available. The principal trouble now, and no doubt the one that has created the impression of a lumber shortage, is the fact that the railroads are placing cars only for shipments on Government contracts, thereby depriving the mills of the ability to ship to general dealers and consumers. This, of course, will be relieved after the Government's requirements are satisfied.

"I think, therefore, looking the situation over, that you can safely assure your readers that there will be an ample supply of lumber. If the railroads can get it to market there ought to be no difficulty in architects, builders and consumers getting all the lumber they need."—W. B. ROPER, Secretary-Treasurer, The North Carolina Pine Association.

The Lumber Situation and the Government's Requirements

No Shortage Probable—Transportation the Big Problem—Production Ample for All Needs

SO widespread has been the publicity given the Government's unusual requirements for lumber for cantonment and ship construction that the general public is assuming the existence of a lumber famine and the impression is almost universally prevalent that lumber prices have advanced to a prohibitive point. These are misapprehensions which the ordinary consumer has no means of analyzing and disproving. He does not know, for example, that the lumber industry of the United States, with its present mill equipment, is capable of producing far more lumber than there is a market for in any normal time, and that this potential over-production has long been the adverse factor that has kept lumber prices close to the actual cost of production.

Shortly after the Federal Trade Commission came into existence, it conducted an investigation of the lumber manufacturing industries of the United States, that investigation having been requested by the manufacturers themselves. The Commission found a heavy excess sawmill capacity over that needed to meet the country's actual requirements, and it was demonstrated also in that investigation that lumber was being sold at and even below the cost of production, with heavy financial loss to large numbers of timber owners and manufacturers.

This excess of sawmill capacity under present extraordinary conditions can be turned to good account for the benefit of the whole country, and doubtless will be as soon as the railroads are able to take care of the lumber tonnage offered them. Thus far, it has been quite impossible for most of the larger manufacturing plants, particularly in the South and on the Pacific Coast, to operate to the limit of their capacity, because cars have not been obtainable in which to move the product. One large Southern producing company cut the operating time of its plant several months ago because it had 100,000,000 ft. of lumber in pile and no room for a further accumulation. That company has not yet resumed normal operation because it is not getting sufficient cars to enable it to ship as much lumber as it is able to cut, but will gladly put its plant on a full time basis as soon as the railroads can move the output. This case is typical of the predicament in which large numbers of manufacturers of lumber have found themselves in recent months. They are exerting themselves to the utmost to meet the requirements of the Government and the latter is providing cars to take care of the lumber they are cutting for its use. But they could manufacture more material and meet the requirements of ordinary buyers to a much more satisfactory extent if they could get the necessary railroad service.

From all parts of the lumber producing area of the United States come reports of improvement in railroad efficiency, and a material increase in the volume of cars obtainable for lumber loading, so it is not unreasonable to assume that after shipments to the cantonments and camps shall have been completed, there will be plenty of lumber obtainable for ordinary purposes and at reasonable prices.

Despite the widely prevalent idea to the contrary, it is a fact that lumber prices have not advanced as steadily as most other commodity values, and when conditions in the lumber industry before the war are taken into account, it becomes apparent that the increased cost of lumber is not entirely due to the war but is in some measure chargeable to a process of economic adjustment that was inevitable, war or no war. For one thing, wages in the lumber industry were due to advance, regardless of hostilities abroad, and the lumber industry has for some time been face to face with the necessity of reducing the length of its working day. Labor in the wood and sawmills is far from the eight-hour goal, but it is gradually getting away from the eleven-hour day of a few years ago, and there is no doubt that further reductions in the hours of labor in this field are to be expected.

"SOME SPECTACULAR figures have been published as to the quantity of lumber the Government will buy for purposes of national defence, and some of these orders, of course, are very large. But after all the total governmental requirements are not likely to exceed 5 per cent of the yearly lumber production of the country. The farmer is the big lumber buyer, and at no time has he been in such a good position to buy the material he needs to build granaries, implement sheds, barns and all other improvements. Figures just published by the United States Department of Agriculture show that the average price of grain on the farm is exactly double what it was at this time last year, while there has been no such increase in the price of the lumber which the farmer wishes to buy. The manager of a number of retail lumber yards in Minnesota and the Dakotas has recently made some striking comparisons of this sort. The advertisements which he is placing in the country newspapers based upon going prices for farm products and for lumber at those points show that while in 1914 it required 33 hogs to buy the material for a seven-room house, the same material can be purchased now for the price of 18 hogs, and that while three years ago it took 703 bushels of wheat to buy a 32 x 56 ft. barn, this same barn can now be purchased for 351 bushels of wheat." — From the Monthly Bulletin of the National Lumber Manufacturers' Association.

IF THE consumer had the facts in his possession he would see the improbability of any worth-waiting-for slump in building material prices. Why not put these facts before him in your advertising?

The big items involved in the production of lumber and its distribution to the consumer are labor; railroad and sawmill equipment, machinery and supplies; and transportation. As has been said, the cost of labor has increased, and without any likelihood that it will ever return to old levels. No one can honestly claim that present wage scales in this industry are too high. As to equipment, machinery and supplies which the lumber manufacturer must buy, every item has advanced tremendously in cost. His logging railroad requires locomotives and steel rails; his woods operations require steam logging machinery, saws, tools and camp supplies; his sawmills require machinery replacements and repairs, leather and rubber belting and packing, lubricating oils and greases, files, knives and miscellaneous tools and many other items. Here it will be seen that the price of steel is an important factor in the cost of producing lumber. Without steel in the form of machinery, railroad equipment, etc., lumber can not be manufactured, so in these respects the producing cost has increased heavily. As to the cost of freight, the railroads are constantly seeking to increase rates and while the advances in freight rates thus far have not been of material consequence in connection with the delivery of lumber to the consumer, there is no doubt that lumber rates are going higher as the railroads are able to make further demonstration of their need of larger revenues.

IT IS an unbusinesslike if not a disloyal act, at a time like this, to make a practice of ordering or selling carload lots of building materials that do not amount to FULL CARLOADS. Load to 10 per cent above every car's marked capacity or until every foot of space is filled. Buy full carloads and insist on having them. Make every freight car carry its capacity load.

Another factor must be taken into account, too, that of the carrying charges on invested capital. The lumber producer who has acquired twenty or twenty-five years' supply of timber is paying taxes on it each year, and must charge up on his books the interest on his investment. The accumulation of taxes and interest must be added to the price of the product when it is offered for sale, and each year these items of cost are increased. This has been particularly true in the last few years, with a pronounced tendency on the part of the states which possess large areas of timber to add heavily to the burden of the timber owner by greatly increasing the rate of taxation on his holdings.

IF YOU have not the most efficient and modern facilities for quick unloading of cars, make money for yourself and do a patriotic act in the bargain by investing in them. Cut out the slow manual handling operations and make quick-acting mechanical apparatus do the work wherever possible. Never before was there an occasion when TIME was so invaluable a national asset as now.

Careful analysis of these various factors contributing to the recent increases in lumber prices will reveal the fact that some, at least, of these factors are of permanent character and cannot be wiped out without bankrupting the industry.

A leading authority on price statistics, Roger W. Babson, in his advice to buyers for August, showed that on ninety-six leading commodities of American trade, the average advance in price, as of July 1, 1917, was 55 per cent over July 1, 1916, and 127 per cent over August 1, 1914. As of the same date, the advance in the price of lumber was 23 per cent over July 1, 1916, and 28 per cent over August 1, 1914. The same authority shows the following advances in price commodities covering the last three years: Lumber 28 per cent, cement 34 per cent, brick 80 per cent, iron 102 per cent, nails 158 per cent, steel 390 per cent.

A bushel of wheat or of any other grain will buy more lumber to-day than it would at any previous time in the last quarter of a century.

According to the National Lumber Manufacturers' Association, it is estimated that the total quantity of lumber required for national defense may amount to 2,000,000 ft. within the next year. This sounds like a very large quantity, but as a matter of fact it is only 5 per cent of the annual lumber production of the country and it is conservatively estimated that there is on hand at the sawmills and in the hands of retail and wholesale dealers throughout the country a total of somewhere between 15,000,000 and 20,000,000 ft., so it will be readily seen that the Government's maximum possible requirements will not long stand in the way of the lumber industry furnishing all the material that will be needed for normal building operations of the sort in which lumber is the largest factor, if the railroads can be induced to furnish the necessary equipment and to move the cars with reasonable rapidity when they are loaded.

Don't detain a freight car! If you can't put it to work let the railroad pass it along to someone who can.

On the Pacific Coast the labor situation is far from satisfactory and is causing heavy curtailment of production. With drastic governmental action against the disloyal activities of the Industrial Workers of the World it is to be expected that this difficulty will soon be entirely eliminated.

Undoubtedly it is true as to some of the minor factors that enter into the cost of building that prices are unduly inflated, as the direct outcome of war conditions. That fact does not apply as to lumber, however, and there is reason to believe that it will hold its present value indefinitely, and, even more than that, will advance in price to the consumer as the country gradually adjusts itself to war conditions and the volume of building shows the increase that now seems inevitable.

Impressions of a "Building Age" Traveler

What the President of an Eastern Pennsylvania Association of Dealers in Masons' Supplies Has to Say

I WROTE you from Lancaster last month. After mailing report of visits in Lancaster County I paid my hotel bill, expecting to come on to New York that afternoon. Much to my surprice, I found I had more money than was needed to get me home, and as I did not want to establish a precedent by turning back expense money, I decided to go on to Reading.

Inquiry developed the information that I could reach Reading by trolley or by using a branch of the Philadelphia & Reading Railroad, but as one of the objects of making this circuit was to use up extra expense money, and as the cost was a little greater by train, of course the railroad was the natural way to travel. After consulting the time table and selecting the best train (there are two a day operating on the same running time) I started for the station.

When I bought my New York ticket I asked the agent if the train carried a diner, but he had never worked anywhere except on this branch line, so he didn't know what I meant. The food supply I found later was confined to milk—the loading and unloading of the milk cans at crossroad platforms preventing continuous slumber.

There was an advantage, however, in the frequent stops, as I was kept awake and could be on the lookout for lumber yards, though they were very few after we crossed the Berks County line. As a matter of fact, there are not very many yards

in Berks County outside of Reading; but Reading itself has some fine yards and is a good distributing point for all kinds of building supplies.

Dealers Handle More than Lumber

It is the exception, however, not only in Reading but throughout eastern Pennsylvania, for the retail lumber dealer to handle anything but lumber. Supplies for the mason are handled by what are known in the trade as "building material dealers." The hardware trade retails cement and distributes the bulk of the building specialties, roofings, plaster board, etc. Perhaps you knew this, but I just found it out and thought it worthy of mention.

The dealers in masons' supplies have an association in eastern Pennsylvania, of which George F. Erich of Allentown is president.

As I could not get a room at the Berkshire—Reading's one "best" hotel—I decided the next morning that Berks County didn't need any particular attention just at this time and went on to Allentown to see Mr. Erich.

An Enterprising Firm of Dealers

George F. Erich & Co. handle coal, mason materials and all kinds of building specialties. The general appearance of the yard and offices furnishes conclusive evidence that there is a real business man about the establishment; and as you walk into Mr. Erich's office you know instinctively who this man is. Mr. Erich was busy but received me courteously and listened attentively while I told him of the revised BUILDING AGE and what we hope to accomplish through it for the dealer. When I had finished my story he said:

"Yes, the dealers need that, all right; but there are two things in the way of its doing much good. The first is that they won't read it, and the second is that only a small percentage would appreciate the importance of it and benefit by it if they did read it. You evidently don't appreciate how hard it is to get these fellows interested.

Pennsylvania Association of Dealers in Mason's Supplies

"Our association has about three hundred members. We cover Pennsylvania east of Altoona and Delaware. There are approximately 1500 dealers in this territory. We have a membership of approximately 300. At our last meeting at Philadelphia we had three of the best speakers on three of the most important subjects affecting the dealers' profits. We sent out 1500 announcements and invitations to dealers to attend.

"Officers of the association and members of the executive committee wrote personal letters calling attention to this meeting and urging attendance. With all of this effort we had only eighty-two dealers present, and any one of these talks was worth five times what it would have cost any man from the most distant point to attend.

"Undoubtedly the industry needs just the things you mention. If these dealers could be brought to understand what it actually costs them to do business, if they appreciated the importance of figuring overhead and turnovers and knew how to figure, there wouldn't be any trouble about prices. Price-cutting develops in almost every instance through failure on the part of the dealers to appreciate how much it costs to handle the material. Why, I will venture that not over 2 per cent of the dealers in this territory know how much it costs to handle and deliver a ton of cement.

President Often Called Upon to Unravel Tangles

"As president of this association, I am called in sometimes to help to straighten out tangles, and every time the trouble is due to a failure to apply simple business principles. We are doing all we can. This year we have a paid secretary who is spending his time out among the dealers in an effort to bring them to a more practical knowledge of these things; but they won't read. I wish every dealer in this territory would read and study along the lines you suggest, but I am afraid it will be several years before we can hope to bring them to that point."

I called upon other officials of the Building Material Dealers' Association of eastern Pennsylvania and found all of much the same opinion as Mr. Erich. But these men are taking hold of this problem in an intelligent, determined way and they will undoubtedly accomplish results in bringing about better conditions.

Southern Pine for Army Cantonments

In connection with the construction of the various army cantonments in the South, it is interesting to note that the Southern Pine industry is entitled to great credit for the part which it played in the success of the undertaking. Lumber was the one big item that had to be provided promptly and in large quantities and the Government early called on the pine industry with its tremendous resources to furnish the major portion of wood needed. The full amount of these requirements, approximately 200,000,000 ft. of Southern pine has gone into the construction of cantonments and smaller camps, to haul which there were required over 10,000 freight cars, or between 238 and 250 solid train loads of lumber. By means of the Southern Pine Emergency Distributing Organization, it was possible ofttimes for trains of lumber to be loaded and moving to destination point within six hours after the order had been received from Washington.

"Lumber Advances Least" is the title of an interesting booklet just issued from the offices of the Southern Pine Association, New Orleans, La. The booklet contains a graphic comparison of price variations in building materials covering a period of six years. As was expected, the figures show steel far in the lead of other materials in its climb skyward since 1912, with an advance of 148.5 per cent. Cement is up 55.5 per cent, brick 38.1 per cent, yellow pine and lumber 17.07 per cent.

As Seen By the Man on the Roof

Poems of Pessimism

(There are so many " Chirrups of Cheer for Each Day of the Year," and such other oodles of optimism printed nowadays that the Man on the Roof has decided to put over some " Poems of Pessimism and Glimmers of Gloom.")

I.—More

"When selling things," Dad used to tel
And tell me o'er and o'er,
"Give what is right, and then, as well,
Just give a little more—
Give every fellow that you sell
More than he bargained for."

I tried it. Here is what befell,
And why I'm sort of sore:
I give them service that is swell
In office, yard and store.
The more I give the more they yell—
They want a little more!

Worrying About It

The hardest work you ever do
Is worrying about it;
What makes an hour resemble two
Is worrying about it.
The time goes mighty slowly when
You sit and sigh and sigh again
And think of work ahead, and then
Keep worrying about it.

The hardest part of any job
Is worrying about it,
Your joy to kill, your rest to rob,
Is worrying about it.
The lowest spot to view a hill
Is from the bottom; higher still
It looks each moment that you kill
In worrying about it.

But, if you start to climb, you soon
Quit worrying about it,
Quit waiting, wishing for the moon
And worrying about it.
A human task just grows and grows
By putting off; time may disclose
'Twas easier than you suppose—
Quit worrying about it.

Just buckle up and buckle in—
Quit worrying about it.
By work, not worry, you will win—
Quit worrying about it.
A task is easy, once begun;
It has its labor and its fun;
So grab a hold and *do* it, son—
Quit worrying about it!

Cal, the Carpenter, Says:

You have to see right to saw right.

Some men express their disapproval and freight their praise.

The largest room in many a house is the room for improvement.

Some men never think of their hammer until they are on the roof.

I like to lend a saw about as well as a barber likes to lend a razor.

Some owners are like newspapers; they issue extras every few minutes.

There is a lot of satisfaction in talking back, and mighty little money.

The wise father doesn't confine his efforts to shingling a boy's hair.

Some men have religion for the same reason they have putty—to cover their sins.

The man who is careless with his material isn't likely to be careful with his work.

A man is like a scaffold; the higher he gets the stronger he needs to be.

The time to talk religion to a man isn't when he has just dropped a 2 x 8 on his foot.

Many a man spends his time painting the town when what really needs it is his own house.

If we had to pull nails with our teeth we would be more careful about starting them right.

When the wife bosses the building, you can generally figure who is going to boss the house.

Getting good work out of a careless carpenter is like trying to drive a crooked nail.

The boss says he wishes he knew all that a township board doesn't about building a bridge.

Some people never think of fireproof until it is time to furnish it to the insurance company.

Sometimes a fellow's boss is such a false alarm that a man feels he is laboring under a delusion.

It is the work we leave undone and the things we don't leave unsaid that get us into the most of our trouble.

Don't be discouraged if you make an occasional mistake; if men didn't there wouldn't need to be any claw on a hammer.

You Just Can't Suit Some People

"You just can't suit some people."

"For instance?"

"Fellow had his house picked up by a cyclone and landed over in another county without being damaged."

"And yet?"

"And yet he was sore because it didn't land over a cellar-hole."

Novel Method of Displaying Materials

Of decided value in the displaying of various samples of building materials is the method followed by a progressive firm in New York State. This concern believes that a customer can get a far better idea of the appearance of the material if it is seen installed than if it is shown only as an isolated piece. As the concern does quite a lot of house building, it evolved a plan which would help to demonstrate clearly to the lay mind as well as to the trade the merits of the product in which the customer might be interested.

An upstairs office was laid out as a place for the keeping of samples and catalogs of all kinds of materials. One wall was laid up with a wainscot of the various sized tile commonly used in bathrooms, the different sizes and styles being laid in individual panels which harmonized one with the other. Above this, wall board in variously arranged patterns was displayed. The other three walls carried out the same idea of displaying interior trim, brick, etc., so that they would convey, as nearly as possible, finished ideas. The floor was laid up in squares of various grades and kinds of flooring which the concern is pushing.

Glancing out of the window, a customer can see several large panels of stucco, each panel having a different color and finish. This has proved itself of decided help in introducing stucco colors, and has also afforded valuable data as to the way in which the various colors are affected by the elements.

Of course, considerable time and expense was devoted to securing this display, but the company feels that many sales, which otherwise would have been lost, have been clinched by this display room, the service being of decided value to prospective home builders as well as to building contractors.

The Farmhouse Improved

Under the above title a bulletin is being sent out by the Engineering Experiment Station of the Kansas State Agricultural College in co-operation with the National Lumber Manufacturers' Association which contains much interesting information. It is known as "Bulletin No. 7" and has been prepared by William A. Etherton. This is the first bulletin on farmhouses by the Engineering Experiment Station, and its purposes are first to answer collectively many questions which heretofore have had to be answered individually, and second, to give a first aid in building a new house or remodeling the old one. It may help the prospective builder to a better conception of the importance of the house problem, of its magnitude, its difficulties and its possibilities. The bulletin is in a way a book of reminders—not of all building items, but of many with which the layman needs first to be acquainted. It may help to avoid the dangers of pet ideas and notions which are often favored to the detriment of other items of equal or greater importance. Its third purpose is to help owners to know and to enable them better to explain their housing needs so as to get from architects the kind and class of service which the importance of their problem demands. Again, it is to aid the reader in estimating the relative merits of houses and of house plans, also to provide for teachers who are in need of such help, a logical outline and a brief description of house building problems. Finally, it is to explain such general items about building as may well be omitted from future descriptions of house plans; in other words, to be introductory to succeeding bulletins on farmhouses. The bulletin is not a book of plans, although a few examples are shown primarily for the purpose of explaining the text. The text outlines the farmhouse problem in a very general way and without special regard for local conditions. This seems necessary to an impartial consideration of the many items of general importance that need carefully to be regarded.

A most pertinent statement is that "the house plan that is needed by the farm owner cannot often be found; it must be made."

Lumbermen Endorse "Building Age" Policy

The following letter from Paul S. Collier, secretary, The Retail Lumber Dealers' Association of the State of New York, will be read with interest by the trade at large:

"The stand which you take relative to the mail-order business in the July issue of the BUILDING AGE is to be heartily commended by the lumber trade as well as by the entire building trade. It is fundamentally in the direction of more economical distribution and is in accord with the principles of true community development. I sincerely trust that you will find your attitude on this question heartily approved and supported by those favorably affected. I shall bring this matter up for formal consideration at a future meeting of our board of directors."

Announcement is made of the appointment of Philip Lanier, of the firm of Foster & Lanier, New Orleans, La., as assistant to the director of the Southern Pine Emergency Bureau, succeeding A. J. Carroll, who severed his connection with the bureau on Sept. 1 to become general manager of the newly organized Gulfport Wholesale Lumber Company at Gulfport, Miss. Mr. Lanier brings to his new position long experience in many branches of the lumber industry having gained the rudiments of the business in North Louisiana and Eastern Texas. The firm of Foster & Lanier will be continued under the direction of Mr. Foster.

According to United States Consul, George A. Bucklin, at Bordeaux, France, immediate offers with catalogs are desired on demountable frame houses. He states that an extensive market is available.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

"Superior" Inside Corner Bead

A metal corner bead, which is intended to insure correct lines in plastered surfaces where wall meets wall or ceiling, has been brought out under the name "Superior" by the Milwaukee Corrugating Company, Milwaukee, Wis., and a general view of it is presented in



Fig. 1—The "Superior" Inside Corner Bead

Fig. 1. This inside corner bead furnishes grounds to which the mechanic can work, thus necessitating the application of an adequate coat of mortar over the lath and doing away with the common skimping of the motar coat, especially from the jambs back to the inner angles of the walls. By reason of its construction this bead is said to take up in a large degree the strain of building settlements and the warping and shrinking of timbers, thus preventing the cracks often seen in the angles of a plastered room or radiating therefrom. This corner bead is made from galvanized open hearth sheets and is furnished in 5, 6, 7, 8, 9, 10 and 12 ft. lengths. The company states that for a small additional sum a clip is furnished so that either wing of the bead may be extended 1½ in. so as to afford ample nailing room for joining of wood lath, metal lath or plaster block partitions on brick or tile walls. This construction, it is claimed, eliminates splintering or clipping.

The "New Era" Check Writer

The check writer has been demonstrated through practical experience to be one of the necessities of modern business. The unprotected check forms a ready field for the activities of the professional forger and many business men have lost considerable sums through the raising of their checks before check writers were brought into existence to combat this evil.

According to the Supreme Court, the maker of a check is obliged to use all due diligence in protecting it. The omission to use the most effectual protection against alteration (evidence of neglect) renders him responsible for the forged amount, the bank being only responsible for ordinary care in paying a check. The purport of this decision is that if the drawer of a check which has been altered and payed has neglected to use the most effectually known means to protect his check, he must stand the loss occasioned thereby.

It is for this reason that every well equipped office, whether it be that of the contracting builder or the lumber dealer or in whatever line may be the business engaged, should possess among its equipment an up-to-date device for protecting the checks which may be drawn. In a device of this nature visibility is an important factor, together with ease of operation, and a machine so designed as to embody these among other features is the "New Era," illustrated in Fig. 2 and which has just been placed upon the market by the New Era Mfg. Company, 450 Fourth Avenue, New York City. In this machine every stroke of the lever produces a word and every word is instantly visible, thus reducing possibility of mistakes to a minimum. As regards operation a turn of the knob by the left hand finds the desired character quickly and accurately, while a slight movement of the right hand swings the macerating mechanism into play and the check is rapidly and perfectly written.

In the construction of the machine hundreds of little grinding, tearing teeth pulverize and macerate the paper into a cobweb of fibre. Through and through this weakened tissue is forced bright red, acid-proof and ineradicable ink, forming, as far as modern science and ingenuity can determine, an impregnable barrier against alteration. This, it is pointed out, is the reason why the "New Era" check protection covers the intent and meaning of the law. The front plate of the "New Era" check writer is made of brass, German silvered, and the frame and back plate are made of pressed steel highly enameled. The base is of a solid casting and the shelf is made of pressed steel, which is first copper-plated to prevent rusting and then nickel-



Fig. 2—Front View of the "New Era" Check Writer, Model No. 3, Showing the Dial with Pointer

plated. The check writer is very compact and simple in design, being easily handled and is guaranteed for a period of two years. It is known as the No. 3 model and is, we understand, a marked improvement over the No. 2 machine. The company has issued an attractively illustrated pamphlet giving full directions for operating the check writer, so that its merits can be readily and quickly appreciated.

Hollow Tile Makers' Association Establish a Building Code Department

The members of the building fraternity throughout the country will be interested in the statement that at the present time the Hollow Building Tile Association embraces in its membership sixty-five manufacturers representing 2,200,000 tons of material. In percentage it is about 90 per cent of the output of building tile and the association is organized along broad lines. As is well known, the use of all materials in the larger cities of the country is controlled by law and one of the most important problems confronting the tile association is building codes. In order to meet the requirements of the case, it has established a building code department in charge of a trained engineer and it is the intention to have him co-operate with Building Committees and Building Inspectors in all cities and states which are revising their building codes. He will also endeavor to have the code changed whenever it is unfair to the material of the association. The engineer in charge will also make investigations covering the fire-resistant qualities of tile and see that it is properly recognized by the underwriters and insurance companies. Another function will be the collection and distribution of various kinds of information of interest to members of the Tile Association.

Smith-Chicago Underslung Chain Drive Mixer

Building contractors and others making use of concrete mixers—and at the present time their number is almost legion—cannot fail to be interested in the new Underslung Chain Drive Concrete Mixer, which has just been placed upon the market by the T. L. Smith Company, 3120 Hadley Street, Milwaukee, Wis., and illustrations of which are presented herewith. As is well known, the chain drive is an old device for driving mixers, but in making use of it the method heretofore employed has been in one way only and that has been to have the chain encircle the drum. The new idea, as exemplified by the mixer in question, is to drive the drum from underneath only, as this allows the use of a shorter chain and the weight of the drum resting on the chain keeps the latter taut at all times. As there are only a few teeth which are in contact with the chain, there is said to be no chance for the chain to ride off of the teeth. In other words, the new arrangement eliminates two bad features of the ordinary chain drive—stretching and slipping of the chain and the loss of power due to the friction caused by the chain encircling the drum and being pulled together around the drum. This invention is said to be not merely a new "wrinkle," but a forward step in concrete mixer construction which will represent a big saving to the contractor who uses it. In Fig. 3 of the illustrations we present a view of the arrangement, which is shown so clearly as to call for little additional comment. Another point embodied in the new mixer is the self-locking discharge chute which, while not perhaps so important as the underslung chain drive, is still worthy of more than passing mention. Contractors in general will probably appreciate the fact that on the ordinary mixer the weight of the concrete falling on that portion of the chute inside of the drum has a tendency to flip the chute. With the new device, the moment the chute is inserted into the drum, the toggles automatically lock and no matter how much weight is thrown onto the chute inside of the drum, it remains in its position until thrown out by the operator. In Fig. 4 is shown the Smith-Chicago mixer on truck with gasoline engine, power loader and water tank. The gasoline engine used on the mixer is built especially for the company by one of the largest engine concerns in the country and the company states that it takes full responsibility for every gasoline engine furnished on its mixers. In Fig. 5 is shown the No. 7-S Smith-Chicago low-charging mixer on truck with gasoline engine, platform and low feed hopper. This outfit is recommended by the company where the nature of the job requires a lighter machine of the simplest possible design. The loading platform is only 18 in. high and when the mixer is being moved the platform can be quickly removed or can be hooked up in a vertical position and thus be out of the way.

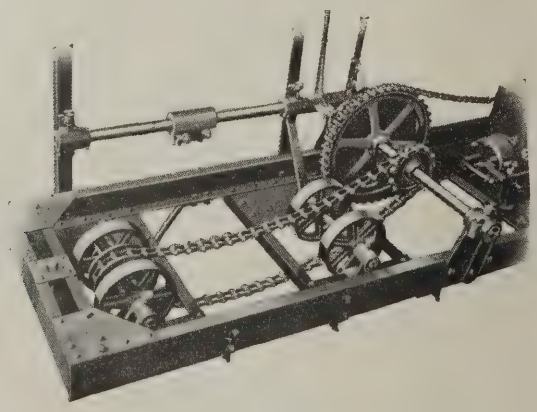


Fig. 3—Mechanism of the Underslung Chain Drive Concrete Mixer Made by the T. L. Smith Co.

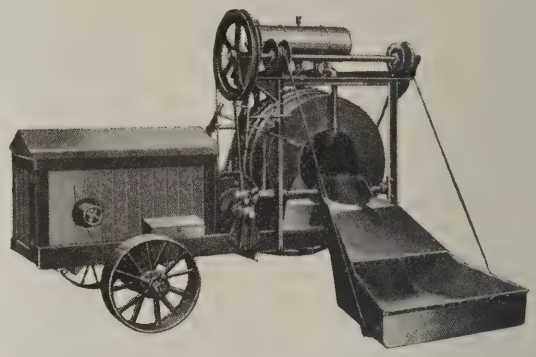


Fig. 4—The Smith-Chicago Mixer on Truck with Gasoline Engine, Power Loader and Water Tank

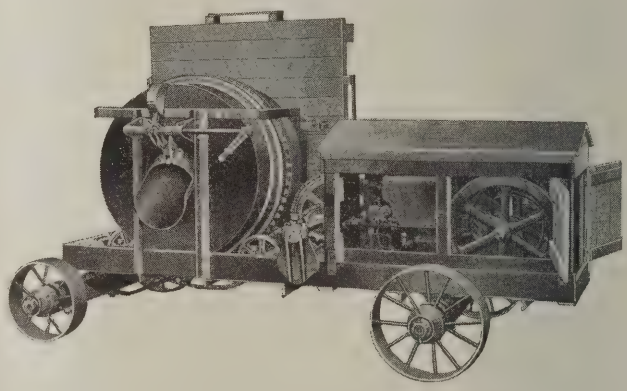


Fig. 5—The Mixer Mounted on Truck with Engine, Platform and Low-Feed Hopper

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How Wall Board Met a National Emergency

Under the above title there has just been issued from the press by the Beaver Board Companies, 115 Beaver Road, Buffalo, N. Y., an attractive eight-page circular setting forth the merits of Beaver Board for a great variety of purposes. One page of the circular is devoted to a letter addressed to dealers handling Beaver Board and, among other things, it has this to say in

(*Continued on page 22 of the Advertising Section*)

Renovation with Stucco Good Business for You

MANY a man will "spruce up the old place" when he won't tear down and build over. Sometimes it is sentiment, sometimes economy.

Renovation can do a lot more than improve the looks of the house. Remodeling and overcoating with stucco make the walls fire resistant—lowering insurance premiums and increasing safety. It makes the home easier to heat in winter, cooler in summer. Lowers cost for repairing or repainting.

The *new color stucco* does wonderful things in color. Toned with exposed aggregates, such as marble and granite screenings, colored sand, gravel, etc., this stucco has a life, character, warmth and individuality not found in ordinary color stucco, and the color lasts.

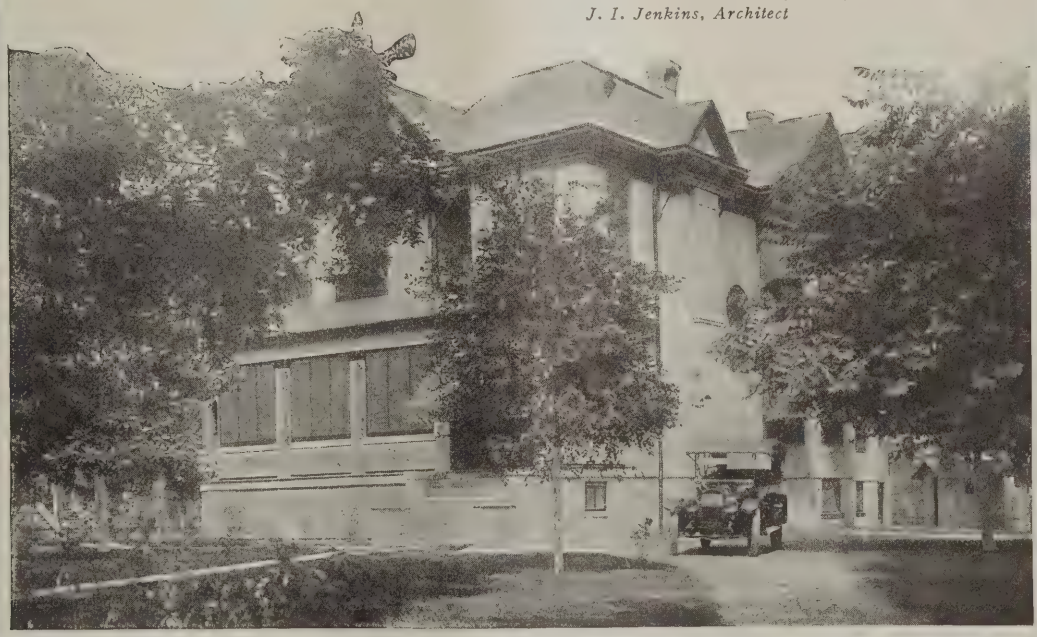
Use the coupon below for valuable information about this new color stucco, remodeling, etc.

The Atlas Portland Cement Company

Members of the Portland Cement Association

New York, Chicago, Phila., Boston, St. Louis, Minneapolis, Des Moines, Dayton, Savannah

Home remodeled with Atlas-White, Cairo, Ill.
J. I. Jenkins, Architect



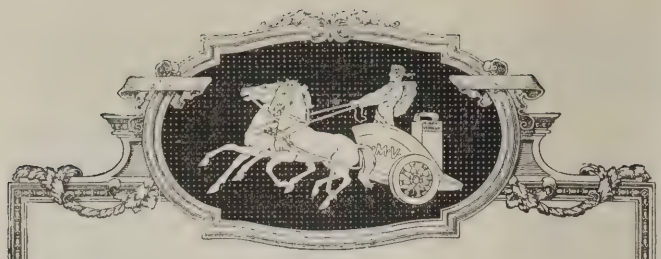
ATLAS WHITE

The Atlas Portland Cement Company,
30 Broad Street, New York, or Corn Exchange Bank Building, Chicago

Send me information and specifications on the new color stucco—also "New Homes for Old" and special information on the subjects checked:

☐ New Stucco Homes ☐ Remodeling in Stucco ☐ Stucco Garages ☐ Stucco Bungalows

NAME.....ADDRESS.....



Don't go against your grain

Even if your customer is holding you down to the minimum price on every item, you can have the kind of finish you believe in, the kind that will show your work at its best and keep it looking well.

Murphy Varnish

"the varnish that lasts longest"

produces a finish unequaled for beauty and durability and its fine working qualities so reduce the amount needed and the labor of applying that it costs no more than second-rate varnish.

Shall we send you information about our products?

Murphy Transparent Interior
Murphy Transparent Floor
Murphy Transparent Spar
Murphy Nogloss Interior
Murphy Semi-gloss Interior
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

Murphy Varnish Company

Franklin Murphy, jr., President

Newark Chicago

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A

(Continued from page 600 of the Editorial Section)

regard to the herculean task the Government is successfully accomplishing in building sixteen cantonments for the training of our new National Army:

"The army engineers chose wall board not simply because it was the quickest and easiest material to use, but especially because it meant permanent walls and ceilings that were sanitary and durable enough to withstand hard usage. No one wall board maker could fill the entire order and it was naturally allotted among several manufacturers."

The company states further in the letter that it had already planned to expend more money for advertising this fall than in any past season, when it received the Government's specifications for many million feet of Beaver Board. "It seemed to us," the company states, "that this use of wall board by the army was a most unusual indorsement of the general advantages of wall board—an indorsement that should be brought to the attention of the public. This Government indorsement of wall board is one that will make a strong and lasting impression on present and future builders," and it is the purpose of the circular in question to show the prospective customers what this indorsement means to the Beaver Board dealer. The company regards the present as a logical time for the lumber dealer to push this product and it is prepared to offer him a high grade of advertising service, in the way of electros of well prepared advertisements, etc. The company also places the service of the advertising department at the command of the dealer, not alone in connection with Beaver Board, but with any advertising that the dealer wishes to put out. Another Beaver Board service that can be used to good advantage this fall is the preparation of special designs and estimates by the Department of Design and Decoration which will prepare without charge any special design the dealer may be able to use. In addition, if the dealer will jot down the names of any persons whom he thinks can utilize wallboard in improving their property and send this list to the Sales Promotion Department, this organization will put the Beaver Board proposition before the dealer's prospect in a way which will tend to make all future efforts on the dealer's part easier and much more productive than would be without this service. Unsettled conditions in the building industry have made it necessary for the retail lumber dealer to advertise and obtain work in new directions if he expects his business to show a reasonable profit, and this service offered by the Beaver Board Companies points out the way to a good start.

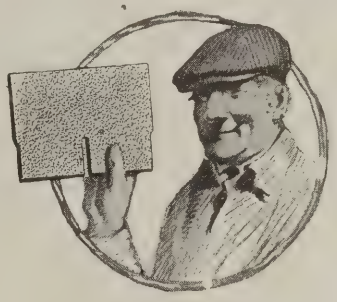
How Contracts for Weatherstrips May Be Secured

Every carpenter-contractor and builder is interested in adding to his business and it has been suggested that among other things he could add weatherstripping as a side issue, making a special effort to secure contracts of this nature. The season is rapidly approaching when weatherstripping of windows and doors will be required and the enterprising carpenter and the builder will be the ones to secure work of this nature. The winter business will be principally in houses already occupied, but new buildings are easier to equip and are a better place for a new man to obtain practice. In this connection it is interesting to note the unique scheme which is being advocated by the Allmetal Weatherstrip Company, 224 West Madison Street, Chicago, Ill., for the purpose of securing weatherstrip contracts by putting the carpenter or the builder quickly in touch with interested prospects. Some special tools are needed for metal weatherstrip work and these the company has arranged to make in its own factory and furnish at actual cost. These tools are returnable at any time and the amount deposited will be refunded, less a reasonable deduction for overhauling if any be necessary. A set of models for demonstration pur-

(Continued on page 24)



A Roofing Job That Lasts



A roof of Neponset Twin Shingles gives an old house a new lease on beauty and usefulness. But Neponset Twin Shingles have more than outward beauty to recommend them.

These famous shingles are made of such wear-resisting materials—tough, fibrous felt; layer upon layer of everlasting asphalt; crushed stone and slate—that permanence is of greater importance.

A roof of Neponset red or green shingles on any house, old or new, is a "drawing card" for any contractor, carpenter or builder. It is a demonstration of his good judgment as regards beauty and durability.

NEPONSET
TWIN
SHINGLES

(Patent applied for)

BIRD NEPONSET PRODUCTS

Neponset Twins are self-spacing. Their twin shape halves the cost of laying and requires 25% fewer nails. They cannot warp, dry out, rot, pull off, curl or blow away. And they are approved by the National Board of Fire Underwriters.

You can get your share of the roofing contracts in your section by mentioning Neponset Twin Shingles. Millions of people already know about "this roofing development of the twentieth century" by reading our advertisements in the national magazines.

Let us submit some interesting facts and figures about Neponset Twin Shingles. We'll send them merely for the asking, and without any obligation.

Look for this trademark on all Shingles, Roll Roofings, Wall Boards and Building Papers. There is one meeting every requirement and purse—all guaranteed by us.

BIRD & SON (Established 1795) Dept. B East Walpole, Mass.

NEW YORK CHICAGO WASHINGTON Canadian Office and Plant, HAMILTON, ONTARIO



Why Every Modern Kitchen Should Have a KOHLER Sink

KOHLER Sinks have the same quality distinctions that make KOHLER Bath Tubs and Lavatories first choice for the well planned home.

The designs have the hygienic features that are characteristic of all

KOHLER WARE

always of one quality—the highest

KOHLER Sinks are made for right and left-hand corners, and for open wall spaces. They have right, left or double sloping drain-boards, and are made without aprons.

"It's in the Kohler Enamel"

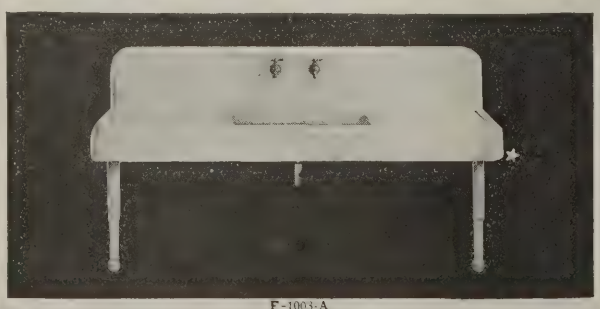
The whiteness of the enamel is notable in all KOHLER products, each of which has our permanent trade-mark—a guarantee of its high quality.

Owing to manufacturing economies the prices of KOHLER WARE are not excessive.

KOHLER CO., *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Pittsburgh Detroit
Chicago Indianapolis St. Paul St. Louis Houston
San Francisco Los Angeles Seattle London

★ The KOHLER permanent trade-mark in faint blue appears on end of sink shown by star.



F-1003-A

poses will be loaned to the builder under the same conditions. The company has issued a series of pamphlets setting forth the plan in detail and copies will be sent to any reader of the BUILDING AGE who may be interested. One relates to the weatherstrip itself, telling how it is made, another gives directions for installing, while leaflets relate to the tools necessary for the purpose. The plan outlined offers the builder a nice, clean side line closely related to his own business, and if he pushes it, will not only make money for him, but very likely bring him in contact with new customers.

Stanley's Improved Chest Handles

Carpenters and building mechanics generally who are so fortunate as to possess a large "kit" of tools requiring a good sized chest to hold it, are likely to be interested in strong handles which will enable them to move the chest about or carry it short distances, taking a firm grip without cramping the hands. In order to meet the demands for a handle of this kind, the Stanley Works, New Britain, Conn., have brought out a wrought steel chest handle in 2½-in., 3¼-in., 4-in. and 5-in. sizes. This handle is furnished in the following



Fig. 6—The Stanley Improved Chest Handle

finishes: Japan, light bronze, antique copper, nickel and Stanley sherardized. The 3¼-in. size is especially adapted for use on mechanics' tool boxes and small chests and the company states that it is the first handle of this style and size to be made in wrought steel. In Fig. 6 we present a view of the handle and it is pictured so clearly that little description would seem to be necessary.

The Lighting Problem in the Home

The importance of the lighting problem in the home is being more and more recognized by the architect and the builder, and greater attention is being given to design than ever before. For many years past there has been a tendency among the designers of buildings to bring about a pleasing harmony between the architecture of the new home and the style of lighting fixture to be installed, and with the entrance of electricity as a necessity and not a luxury, this idea is rapidly growing. In keeping with this conception of what is necessary, large fixture concerns throughout the country are originating and distributing fixture sets which represent either certain historically noted periods or are uniform in design. In addition to securing the advantage of uniformity of design, the builder is usually able to realize a substantial saving on the purchase of each set due to the fact that he is buying a number of fixtures at the same time, which obviates the trouble of separate packing and does away with salesmen's expense because he knows just what to

(*Continued on page* 26)



REDUCE BUILDING COSTS BY USING

KELLASTONE
MAGNESITE STUCCO

Cut the high cost of building materials, yet improve the quality by using Kellastone.

Build for permanence, yet at the same time increase the beauty—use Kellastone.

Build a home that is FIREPROOF and WATERPROOF—no other stucco than Kellastone will accomplish this.

Kellastone Absolutely Will Not Freeze

If you are interested in learning about one of the greatest and most wonderful building materials in existence, the only stuccoing material in creation that may be termed **CRACK FREE—**

WRITE FOR BOOKLET No. 25, which tells about Kellastone—a remarkable MAGNESITE STUCCO.

THE NATIONAL-KELLASTONE CO.
1317 MALLERS BUILDING, CHICAGO, ILL.



Fiberlic

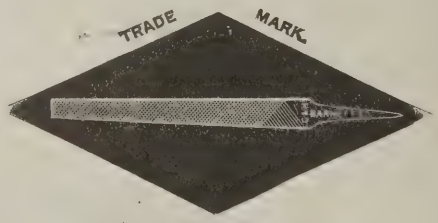
Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.
Owned and Operated by Nicholson File Company

expect when he orders the set. These sets are generally packed together in a carton and as the larger firms usually have a number of these in stock, they can make prompt delivery. One of the large Eastern concerns has recently conducted a campaign for popularizing what is known as its "Louis XVI Design" fixture set, the set consisting of eight fixtures which are intended to solve the lighting problem for any seven-room cottage. These fixture sets are completely wired and ready for hanging, and include glassware of the same design and insulating joints for all the fixtures. These sets are being offered by the Eclipse Light Company, 583 to 587 Broadway, New York City, which maintains a special Customers' Service Department for the purpose of facilitating quick shipments. In introducing this special set to the building trades the company allows a liberal discount on the list price, thus enabling the builder to become acquainted with its merchandise and at the same time enhance the beauty of the houses the builder may be constructing. We understand that this fixture set is to be followed by other combinations of fixtures so that in a short time the builder will be able to select from a series of sets that will cover almost every style of architecture. The company is distributing a dainty folder illustrated by numerous interiors in colors and showing the arrangement and effect of various designs of lighting fixtures which the concern manufactures.

New Use for Expanded Metal Lath

In laying up the ordinary hollow tile wall of buildings for stucco there always has been considerable waste of mortar which would drop into the tile. To prevent this waste and to guard against settlement cracks,

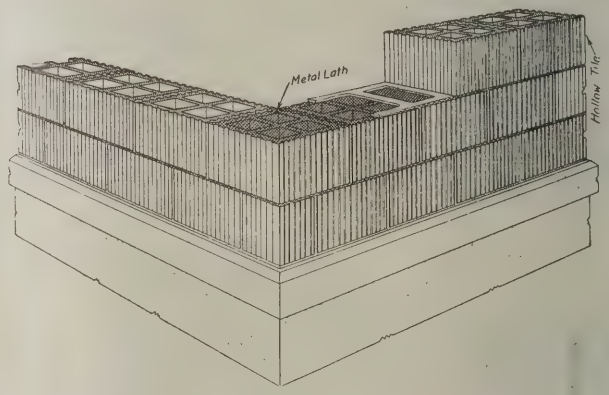


Fig. 7—Showing How Expanded Metal Lath Is Used to Prevent Waste of Mortar

strips of expanded metal lath are laid between each layer of tile before applying the mortar. This method is being recommended by leading tile manufacturers and by the Associated Metal Lath Manufacturers. The illustration, Fig. 7, shows the simple manner in which the lath is used to prevent the waste of the mortar.

Government Use of Plastergon Wall Board

In carrying out the gigantic building operation by the Government of constructing sixteen cantonments in various parts of the country to accommodate the immense army that is now being organized, liberal use has been made of wall board in connection with the erection of the buildings. It is utilized to finish the interior of the rooms above the sill of the upper sash, and it is also used on the underside of the rafters with the exception of the kitchen extensions. Immense

(*Continued on page 28*)

Built for Years of Service — Not Just Made

Years of scientific study and experience in manufacturing high grade planes go into the design of the new Sargent Automatic Set Bench Plane. All parts are carefully machined so that adjustments are easy, and alignments perfect.

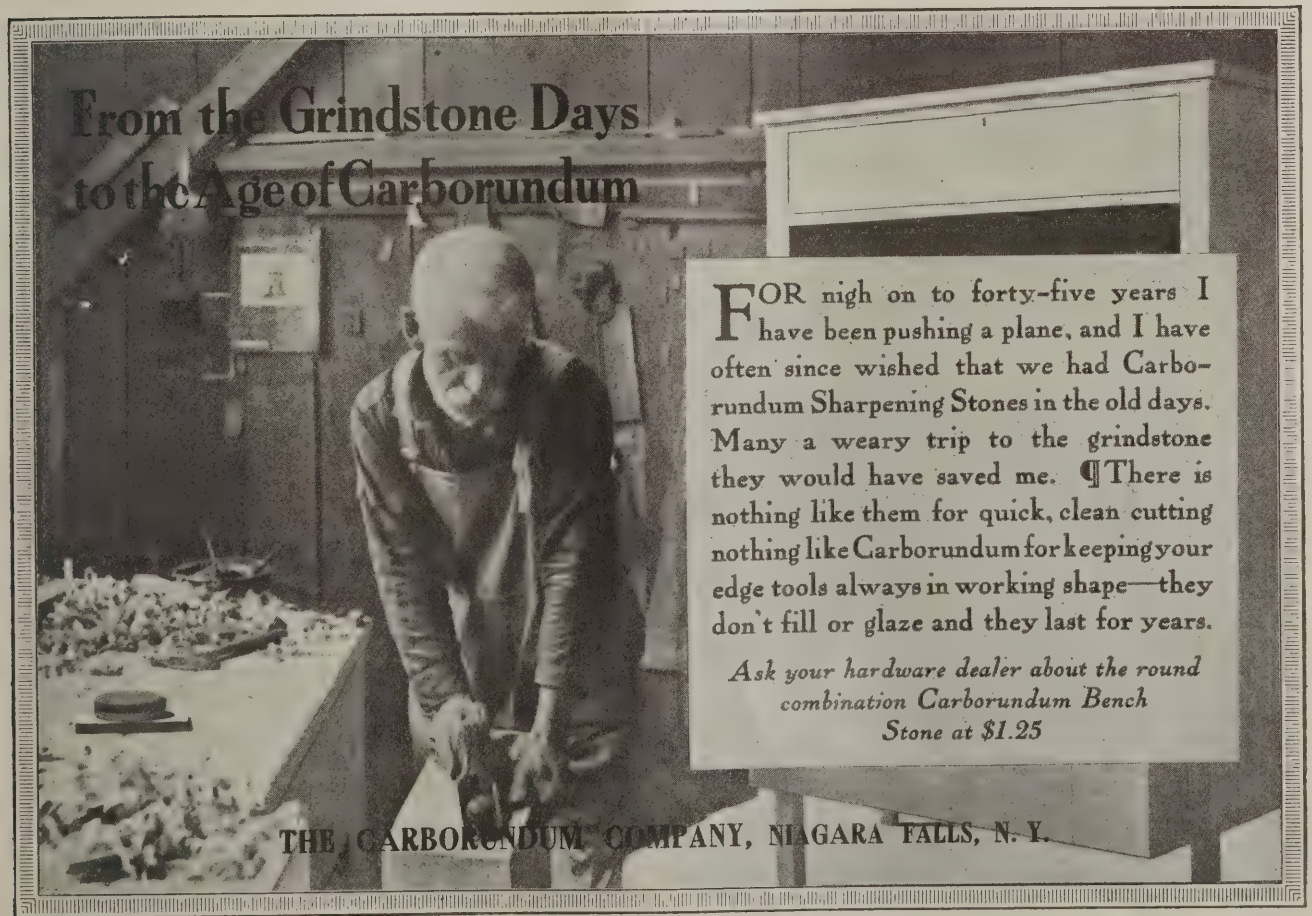
See this new plane at your dealers or write to-day for full descriptive catalogue.

SARGENT & COMPANY
53 Water St., New Haven, Conn.



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20 years from now

Will the roof you are putting on today still be giving satisfaction in 1936?

Will you be ready then to say: ***"This roof has never cost me one cent for repairs!"***

It's worth money to you to know the answer!

Many RU-BER-OID roofs laid previous to 1896 are still giving good service and have never needed repairs.

Genuine RU-BER-OID contains no sand, tar, paper, wood fibre, or any other substance that will crack, run, rot, warp, rust or leak.

Made in Slate Gray, Tile Red and Copper Green. Your dealer will show you samples and quote prices.

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BOSTON CHICAGO

Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete

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Pronounced "RU" as in RUBY
RU-BER-OID ROOFING
COSTS MORE - WEARS LONGER
MADE BY THE STANDARD PAINT COMPANY, NEW YORK, BOSTON, CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ruberoid

quantities of this material were required and it was supplied by various manufacturers. It is officially stated that at Camp Dix, which is the name of the cantonment at Wrightstown, N. J., 2,500,000 sq. ft. of wall board was required. Among the concerns furnishing material of this kind to the Government was the Plastergon Wall Board Company, 202 Philadelphia Avenue, Buffalo, N. Y., who regard this extensive Government use of wall board as a splendid testimony to its merits. In this connection it may be suggested to carpenters and builders who are not regularly using wall board in their work that there are any number of odd jobs possible with it, such as door panels, kitchen cabinets, table tops, etc. The work which may be done with it is of such a nature that the carpenter can be kept busy during the winter months and in other dull times when his services are not required in the line of regular carpentry construction work.

Sliding Door Hardware

Sliding doors are not only popular and convenient in residence work, but are also being used to decided advantage in connection with churches, schools and public buildings, for they permit a large space to be subdivided as conditions may require. There are three prominent types of sliding partitions: parallel door partitions, accordeon door partitions and flush door partitions. Each of these types has its several advantages, all as pointed out by the Richards-Wilcox Mfg. Company, Aurora, Ill., in a booklet entitled "Richards-Wilcox Sliding Door Hardware for Parallel, Accordeon and Flush Door Partitions." Each of the types is taken up and illustrated in turn. Halftone illustrations show the appearance of the various kinds of partitions in actual use, while line cuts show the details of construction. The text points out in a lucid manner im-

(*Continued on page* 30)

Before Deciding On Your Engine—

Look up the question of construction, first cost, quality, power, speed regulation and fuel used. Learn what produces good compression, positive ignition, easy starting, durability and long life. Read about the advantages of vertical valves, high-tension magnetos, **kerosene** as a fuel, preheating fuel, etc. These subjects and many others vital to the engine user are fully explained by word and illustration in Ed. H. Witte's new (copyrighted) book, **"How to Judge Engines."**

Any subscriber who is interested in an engine for any purpose should read this book. It's the **original** "How-to-Judge-an-Engine" book—written from an experience of over 31 years in the business. Ed. H. Witte is the most successful individual gas engine manufacturer in the U. S. today, owning and operating the largest, exclusive, direct-selling engine factory in the world. You get the inside story of engine making by a practical engine man and **inventor** of engines. He tells you what to do with an engine and **"How to Make Money"** with one.

If you want to know the **"Why"** of high-grade gas engine construction, send your name and address, today, to the Witte Engine Works, Dept. 3190, Kansas City, Mo., or 3190 Empire Bldg., Pittsburgh, Pa.—Adv.



District School No. 75, Evanston, Ill. Raeder & Wood, Chicago, Ill., Architects

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on this approved modern method for saving much of the cost of structural steel and foundations?

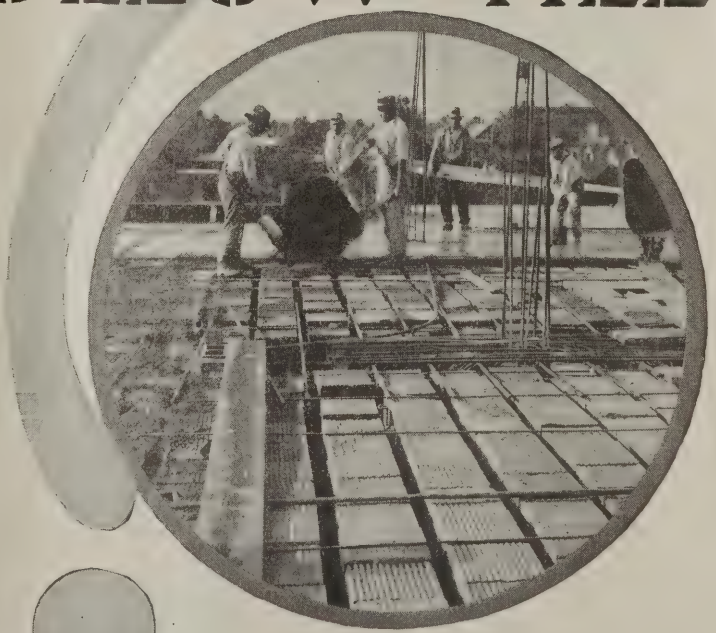
Long Span Floor Construction with NATCO·HOLLOW·TILE

In the use of NATCO Hollow Tile, you are offered a sure and safe way to lessen the dead load, the requirements for support in structural steel and foundations and at the same time conserve the maximum strength. Girders or pipes may be concealed in this form of floor construction by a very slight increase in thickness and dead load.

You have opportunity also to provide a floor of unusual sound deadening properties, of quick erection and the very desirable flat ceiling with its scored surface for plastering and better reflection of light.

NATCO's structural strength withstands better than similar types of construction, the knocks and shocks incident to building operations both before and while it is being placed in floor.

All the data needed with enlightening figures on comparative tests are in our new book, which we will gladly send to any Architect or Engineer upon request. Write today for our Bulletin No. 171.



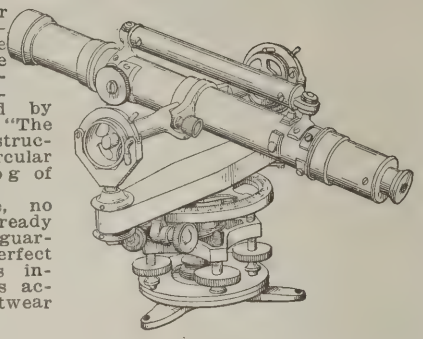
NATIONAL·FIRE·PROOFING COMPANY

578 Federal St. Pittsburgh, Pa.

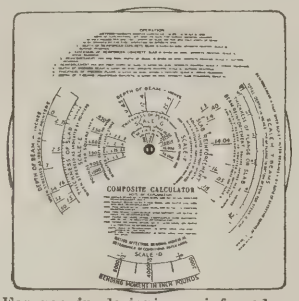
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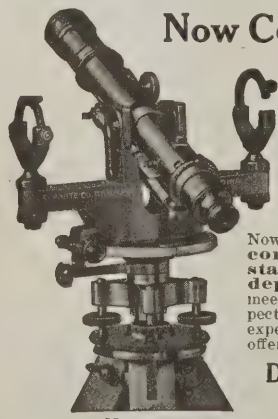
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(Complete with Instructions)

For use in designing reinforced concrete slabs, beams and girders. All computations for concrete are based upon the Joint Committee recommendations, using the Straight Line Formula.

Circular with full particulars.

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Now Comes a New One— The "WHITE" Convertible Level

For many years **"White" levels** have been standard equipment for thousands of contractors. For many years these **accurate, substantial, easily-used instruments** have given unvarying satisfaction. Now comes a new one, the **"White" convertible level—more substantial—more durable—more dependable** than ever. Unless it meets with your highest hopes and expectations it costs you nothing but the experience. Ask for circular and trial offer.

No. 2020

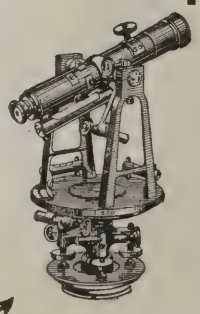
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Useful as the Blue Print!

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"The builder has a lot of worries, but this little transit settles half of them." "I'd as lief start building minus the Blue Print as get along minus the Beckmann Builder's Transit."

—Opinions of a few users!—Costs $85.00. Means accurate construction from cellar to roof.



Made by
L. BECKMANN COMPANY
300 Jackson Street
TOLEDO, OHIO

portant constructive features, thus enabling the building contractor to readily refer to the booklet for any mooted point. Each description of the types of sliding partitions is followed by illustrations and prices of the kind of sliding door hardware necessary to best meet the condition created through the using of the particular type of sliding partition. The scope of the booklet is thoroughly practical, and should commend itself to the building contractor who is interested in this class of work.

Selection Sheet of Ambler Asbestos Shingles

A four-page folder which is being sent out by the Keasbey & Mattison Company, Ambler, Pa., carries *facsimile* reproduction of the colors in which the Century Brand of asbestos shingles are made. These include Newport gray, Indian red and Blue-Black and are also shown cut to shape for the first and second starting courses when laid in accordance with the French or diagonal method, the American method and the Honeycomb method. There are also small sections of roofs showing how these different methods are applied. There is other information in the folder which the builder will appreciate.

The Care of Floors

There has just been issued from the press by the Murphy Varnish Company, Newark, N. J., an attractively printed pamphlet bearing the title "Beautiful Floors and How to Care for Them." The illustrations are numerous and of a rather humorous character, the idea being to show by means of them what happened to a floor. An idea of the primary objects of the pamphlet may be gleaned from the lines which appear under the first illustration showing two men dragging a heavy iron safe over a wooden floor:

"If every floor could tell its tale
Of gross abuse from mankind frail,
We wouldn't have to poetize
To make you quick to Murphyize."

The general text tells how to varnish a new floor, as well as how to clean and care for floors, and there are also presented some interesting comments on quality in varnish and economy in varnishing. In connection with the matter, the merits of the company's products are set forth in a way to appeal to the builder, the house owner and the painter, and in conclusion the pamphlet says: "If you like these sketches and jingles, send them to your friends. They are the plain truth about floors that had been neglected, abused or never properly varnished."

Portable Painting Equipment for Interior Work

Architects and builders all over the country are likely to be interested in a portable equipment for painting the interiors of school, store, office, factory and other buildings, which is said to be a practical elaboration of the already proved and successful Aeron system of painting with air. In fact, excepting the size of the nozzle, the type of Aeron used in applying the coating is said to be the same as that now used by many manufacturers requiring the highest grade finishes for their products. The equipment comprises a portable compressing outfit, consisting of air compressor, gas engine and air receiver with safety valve and pressure gauge, portable paint tank with regulating devices, the Aeron and various lengths of hose for both air and liquid. The compressing outfit is mounted on a hand truck, which can be rolled from place to place either near or in the building, while the paint tank can be placed on the floor of scaffolding and moved

(*Continued on page* 32)

DEPENDABLE PAINT

WHEN you turn your buildings over to owners after painting them with pure paint mixed from linseed oil, pure Carter White Lead, turpentine and colors their appearance is always beautiful beyond their expectations. That places them in the right mood to accept other details about the building as being done up also in a first-class manner. Your white jobs are noticeably whiter than the usual white paint. Colors made on this very white base come out with surprisingly clear and pleasing tones. Your jobs look distinctively well painted.

Time was when farmers painted only for protection. Now they regard appearances too. Witness the passing of the red barn and the red school house. Now there are more white barns than red ones, and still more that are painted some shade of gray or drab or cream and trimmed with white. This has added wonderfully to the attractiveness of country places and perhaps has had a good deal to do with making farms so much more salable.

It is equally evident that paint used by the builder ought to be the most serviceable kind to save him annoyance and avoid the detrimental advertising of a paint failure. Cracking and scaling paint is quite like the unwelcomed cat that comes back. Just when you are about to close on a nice new job up bobs that paint failure again. You have to explain that the paint was supposed to be first class but was not.

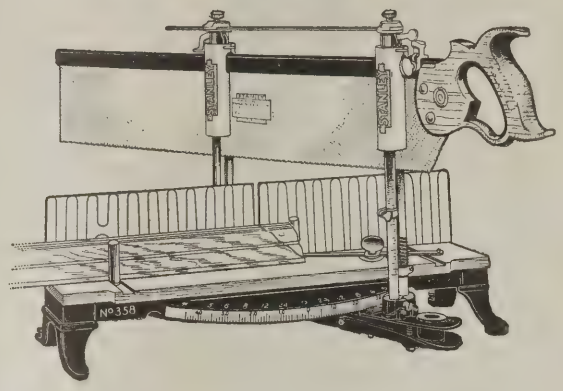
You will never hear anything about Carter Lead jobs except compliments. The advertising it does helps to get many a job and you have no fear of scaling paint. It cannot scale because it is elastic, and so expands and contracts with the wood when the temperature changes.

CARTER WHITE LEAD CO.
West Pullman Station "D"
Chicago, Ill.





Stanley Tools



Stanley Mitre Boxes

STRONG—DURABLE—ACCURATE

A Few Striking Features

Saw is held above work when not in use.

Swivel is automatically locked at any angle.

Two sockets in swivel for use of long or short saw.

Narrow opening in back of frame, especially adapted for small work.

Steel rod uprights for saw guides.

Uprights adjustable for saws of varying thicknesses and for those that run out of true.

Stock guides for holding work in place.

Extra wide range of work—will saw at angle of 30 degrees.

One-piece frame with detachable Malleable iron legs.

Construction thoroughly mechanical; all parts interchangeable and readily replaced if lost.

Quickly and easily put together or taken apart for carrying.

A specially made back saw furnished with each box.

SEND FOR SPECIAL CIRCULAR

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The only Adze made that suits everyone.

Ask any man who has ever used a White Adze.

Send for our catalogue.

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ORIGINATORS

OF

SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal. Used by the United States Government for over 30 Years.**



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BRIDGEPORT, CONN.

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞, weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-888 Progress St. Pittsburgh, Pa.

as the operator may require. This system is being supplied by the DeVilbiss Mfg. Company, 1286 Dorr Street, Toledo, Ohio, and the claim is made that oil paints, first coats and enamels in white and colors, and flat wall paints of all kinds are sprayed to equal advantage on walls and ceilings of wood, brick, concrete or other materials. One coat applied by this method is said to be usually sufficient to cover rough brick and concrete walls uniformly, where brushes are almost useless and wear out quickly. Reference is made to the cleanliness of the work and the saving of material by the use of this spray system. The speed of covering is said to be five times faster than brushing and the loss of time in dipping into and refilling the pail is eliminated through the use of the portable tank, which holds 7 gal. of paint. It is also stated that from 500 to 1000 sq. ft. of surface can be covered per hour, the class of work and paint used being the governing factors. A circular which the company has issued illustrates and describes this system and shows the apparatus required for doing the work. A copy of the folder can ben obtained by any reader of the paper by making application to the address given above.

Some Reasons Why Builders Should Use "Econo" Expanded Metal Lath

In a late issue of "Expanded Metal Construction," published monthly by the North Western Expanded Metal Company, 509 Old Colony Building, Chicago, Ill., was a typewritten leaflet headed with the question, "Do you find it difficult to get reinforcing steel?" As an answer to this it is stated on the leaflet that "Econo" expanded metal can be obtained quickly from the company's factory at Chicago, but there are other reasons, the company states, for using this material on every job of reinforced concrete. These reasons are then enumerated, among them being that "Econo" saves time, can be placed quickly without tying or spacing and saves labor, as any unskilled laborer can place enough reinforcement in half an hour to keep the concrete gang busy for half a day. The numbers, sizes, weights, etc., are given on the leaflet so that the builder receiving a copy of it will have before him all necessary information.

The Advantages of Surfacing Floors

A circular in which the endeavor has been made to impress upon contractors and builders the advantages of surfacing floors by machinery instead of following the old method of hand scraping has just been issued from the press by the American Floor Surfacing Machine Company, 521 South St. Claire Street, Toledo, Ohio. Attention is called to the scarcity and high cost of labor at the present time and there is presented a comparison of the cost of surfacing floors, the new and old way. The circular also gives a description of the "American Universal" floor surfacing machine, which is operated by an electric motor, and the matter is presented in a way to strongly appeal to the enterprising carpenter and builder. There are also several letters from contractors, who point out the great saving which has been accomplished in the amount of labor expended in doing work of this kind. We understand that a copy of this circular may be obtained by any reader wha will make application for it.

Write Today for Free Sample

Degrah TRADE MARK REGISTERED

A New and Wonderful Wood Finish

Quick drying and non-penetrating like Shellac. Glossy, smooth and tough as Lacquer. Less expensive and more durable than Varnish. Takes the place of all three. Dries in three hours. A fresh coat can be applied and sand papered each day. DEGRAH also comes as a white enamel—also as an Enamel Varnish. To the latter you merely add zinc in oil to make your own white enamel. DEGRAH White Enamel saves you big money on contracting work.

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Containing Colored Supplemental Plate with Plans and Constructive Details

Building Age



NOVEMBER, 1917 PRICE 20 CENTS

WE ARE

Not Dependent upon Germany for Coloring Materials

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FOR ANY KIND OF BUILDING

☐ **Hudson Asphalt Shingles**

Mineral surfaced Red, Green Mottled furnished in Individual Shingles 8" x 12¾" and in strips 10" x 40" with 5 shingles to a strip. Hudson Strip Shingles can be very quickly laid.

☐ **Protection Brand Roofing**

Mineral Surfaced; has 6" lap. (Pat. Nov. 18, 1902.) Laid with all nails covered.

The Mineral Surfaces used in the manufacture of Hudson Shingles and Protection Roofing are in their natural unfaded colors. No artificial coloring used.

☐ **Hudson Brand Asphalt Felt**

For built-up roofs. For sheathing buildings and reinforcing slate and tile roofs. You will like Hudson Felt. It is pliable; will not dry up or crack, as it does not stick at the butts. You can use every inch of it.

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Cut out this advertisement and put an X in the ☐ along side of the material you are interested in. Mail it to us and we will gladly send samples.

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The Wood-Mosaic Kind

For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

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Convincing Contrast

The Bay Stater transformed *that* house.

A coat or two of Bay State Coating lifted it above its neighbors. Gave it a beautiful, smooth, white appearance—and did *more*. It made the walls waterproof, wearproof, dustproof and every-other-kind-of-proof such as a house needs to stay new.

Bay State Brick and Cement Coating won't let a house grow "seedy." This coating is made to preserve walls of brick, cement and stucco. And it does it with interest.

Send for a free sample. Try it. See how it works. Bay State Coating comes in white and a variety of tints. Mention the color sample you want. Booklet No. 19 will be of interest to you.

Bay State Cement Crack Filler makes cracks in cement disappear like magic. A sample will prove it.

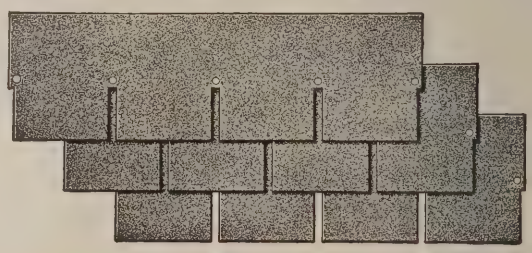
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Paint and Varnish Makers, Boston, Mass.
New York Office: Architects' Bldg.

The Bay Stater

BAY STATE Brick and Cement Coating



REX STRIP SHINGLES



Save at Both Ends

DEALERS who sell and builders who use Rex Strip Shingles save in many ways.

These shingles cost less than individual shingles, and weigh only 185 pounds per square. Thus the dealer saves, even in freight, and passes his saving along to the builder—who in turn requires less nails and less labor of nailing than with individual shingles.

This combined saving makes it easier to sell the roof to the house owner.

Our Big Catalog No. 20 that tells all about Rex Strip Shingles—and other Rex Products—will be mailed (samples included) on request.

The Flintkote Company, Inc.

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The Building Age

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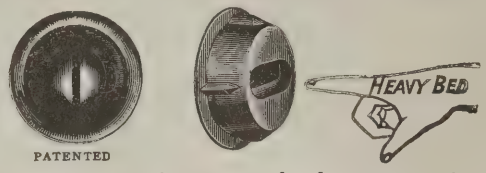
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Ives Patent Window Stop Adjuster

Prevents Drafts, Dust and Window Rattling



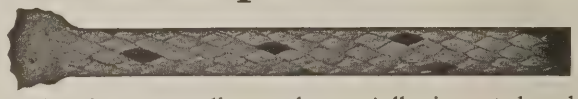
The only stop adjuster made from one piece of metal with solid ribs and heavy bed that will not cup or turn in tightening the screw.

Descriptive circular mailed on application

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Manufacturers of Builders' Hardware

Samson Spot Sash Cord



Made of extra quality stock, carefully inspected and guaranteed free from the imperfections of braid and finish which destroy common cords so quickly.



The spots on the Cord, in any color, are our trade mark, used only with this extra quality.

Samples and full information gladly sent.

Samson Cordage Works

Boston, Mass.



"Stucco Coated Frame Residence."
Geo. J. Hardway, Architect.

"The Shingles of the roof were dipped 10" in Cabot's Shingle Stain before being laid, and they were given a brush coat when the house was finished. The stucco finish received two coats of Cabot's Stucco Stain."

Cabot's Shingle Stains

They have been the standard for more than twenty-five years, and are specified by nine-tenths of the architects, who know them from experience. Their colors are soft, rich and beautiful, and guaranteed fast. Their vehicle is Creosote, which thoroughly preserves the wood, and they contain no kerosene or other cheapener. Why experiment with unknown stains, when you are **sure** of Cabot's?

Cabot's Stucco Stains

are the only artistic cement finishes. They give soft, natural coloring effects, without covering the surface with a painty coating. They are also cheaper than coatings and easier to apply, and they cannot crack or peel.

You can get Cabot's goods all over the country. Send for samples and name of nearest agent.

SAMUEL CABOT, Inc.

Manufacturing Chemists **BOSTON, MASS.**
1133 Broadway, New York **24 W. Kinzie St., Chicago**

Cabot's Brick Stains, "Quilt" Conservo Wood Preservative, Damp-proofing, etc.

In-Lade

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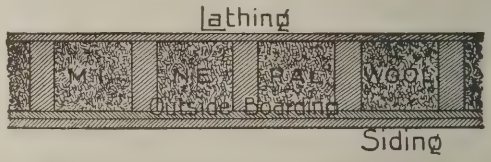
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BUILDING AGE

NEW YORK, NOVEMBER, 1917

A Dainty Tea House in Austin, Texas

Many Features of Construction Likely to Prove Interesting to the Practical Builder

PICTURESQUELY located in one of the interesting thoroughfares of the city of Austin and opposite the grounds of the University of Texas is a neat and attractive one-story building with covered porch extending across the entire front and finished in rather quaint effects. Above the main entrance is a gable in Early English treatment, with decorations consisting of carvings in butterfly. The building is that of the Cactus Tea Room, a social center owned privately but devised especially to accommodate students of the University of Texas.

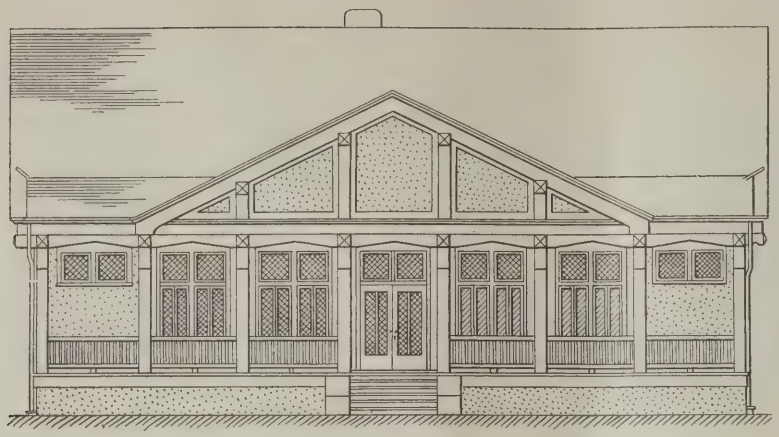
The arrangement of the main floor is clearly indicated on the plan presented on another page. The space is divided into a 30 x 50 ft. tea room with three booths, a 16½ x 20 ft. private dining room, a kitchen with two pantries, retiring rooms and a screen porch. Many details of the construction are indicated in the various line drawings presented upon some of the following pages.



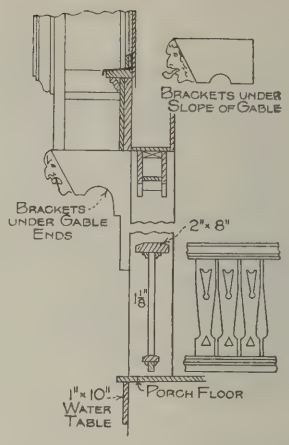
Interior View of the Tea Room Looking Toward the Booths and with a Glimpse of the Private Dining Room at the Right

wood and stained. In the frieze and barge boards are cactus leaves, flowers and fruits, while on brackets on the porch posts are carved heads representing various phases of University life. There are among others the Co-ed, the embryo law student, the sour professor, the camp-fire girl and the

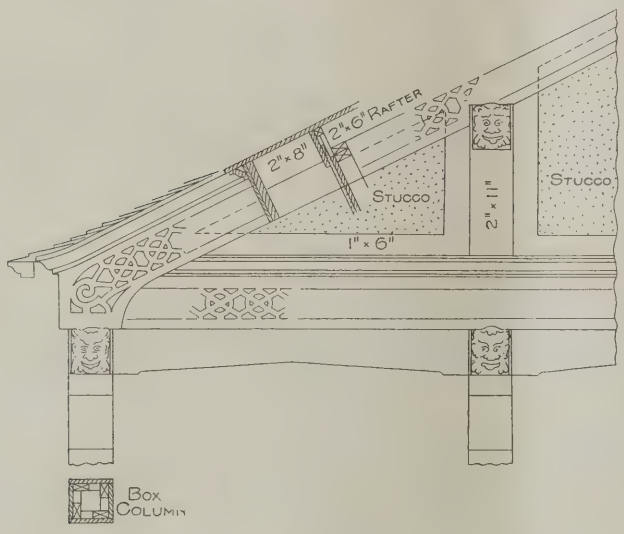
In the construction of the building the foundation walls are of concrete 6 in. thick and resting on



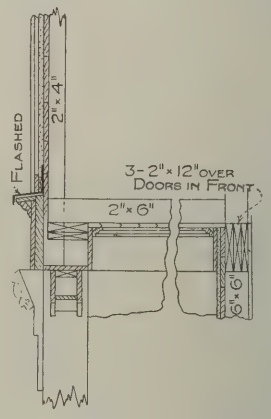
Front Elevation of the Building—Scale 1/16 In. to the Foot



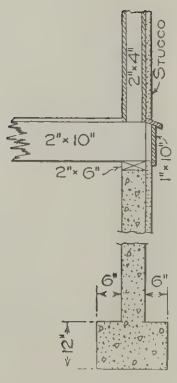
Details of Porch Balustrade and Brackets—Scale ¼ In. to the Foot



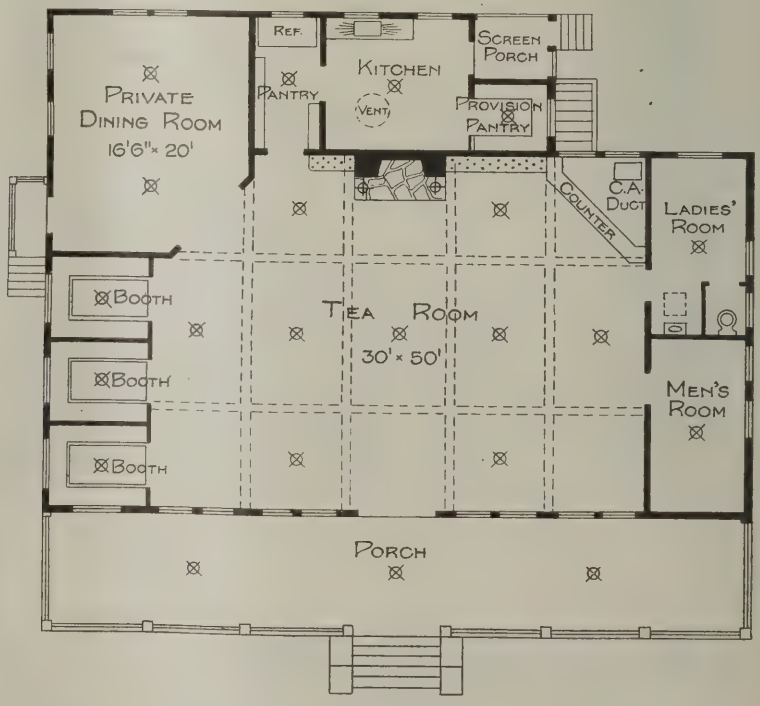
Details of Front Gable and Showing Construction of Box Columns—Scale ¼ In. to the Foot



Section Through Front Gable—Scale ¼ In. to the Foot



Section Through Outside Wall of the House—Scale ¼ In to the Foot



Main Floor Plan—Scale 1/16 In. to the Foot

Floor Plan, Elevation and Miscellaneous Constructive Details of Tea House at Austin, Texas

concrete footings 12 in. deep extending 6 in. on either side of the wall. The lumber of which the "forms" were built were later used for rough work in the building.

The two 6 x 8 in. girders running longitudinally under the center of the building and carrying the 2 x 10 in. floor joists, are supported by 8 in. round cedar posts set in concrete footings, the posts extending 18 in. into the concrete and having 12 in. of concrete beneath the lower ends and with 6 in. of concrete surrounding them. The 6 x 8 in. extending under the front wall of the house rests on concrete piers 12 in. square, supported on footings 6 in. larger each way. The concrete used consisted of a mixture of one part cement and five parts sand and gravel.

In the foundation walls where shown on the and collar beams, and 2 x 8 in. rafters placed 18 in. on centers.

The outside walls and gables are covered with Neponset building paper well lapped, over which was placed Kno-fur lath to receive the two-coat stucco work. The concrete foundation walls are also covered with stucco. The first coat was made up of equal parts of cement and sand with sufficient lime putty to make it work well. The second coat was made of sand and cement without lime and was given a rough coat surface. After the final coat had set, it was given a coat of colored cement paint.

The gables are finished in half-timber effect with the front arranged in panels as shown in the picture and on the elevation. The louvres in the gables where shown are constructed of 1 x 4 in. boards placed 3 in. apart.



The Tea Room as Viewed from the Street Approach—S. E. Gideon and H. F. Kuehne, Associate Architects, Austin, Texas

elevations are batten doors 3 ft. wide and hung on 2 in. plank frames. There are also 8 x 12 in. cast-iron vent grills where shown on the elevations.

The chimney flues are run independently, the kitchen flue being 9 x 9 in. and the fireplace flue 9 x 13 in., both lined with terra cotta flue lining. The exposed portions of the chimney are covered with two-coat stucco work.

The framing timbers consist of 2 x 6 in. sills resting on concrete walls; 6 x 8 in. girders with 4 x 8 in. for the porch or "gallery," as it is called in the South; 6 x 6 in. posts, 4 x 4 in. plates, 2 x 6 in. studs for the side walls and service portion; 2 x 10 in. floor joists placed 16 in. on centers and bridged with 1 x 3 in. stuff; 2 x 8 in. joists for the gallery, placed 18 in. on centers; 2 x 6 in. braces

The front porch columns are 11 x 11 in. in size built on a 2 x 4 in. frame. Alternate columns have a 4 x 4 in. post inside to support the gable. The porches are ceiled with 1 x 4 in. V-cut ceiling.

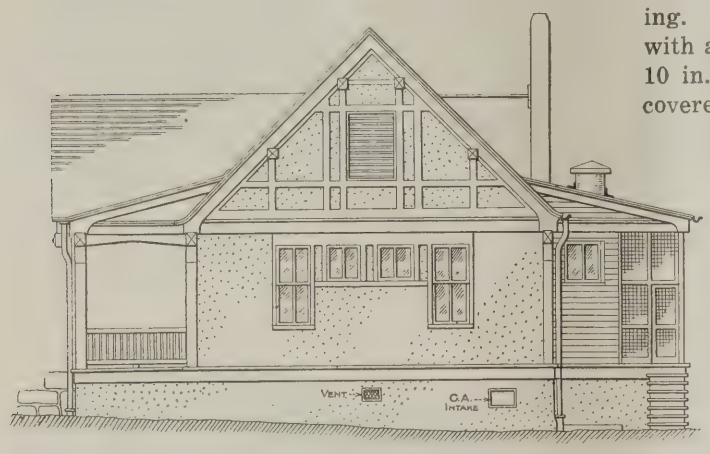
The roof rafters are covered with 1 x 4 in. battens to receive the cypress shingles laid 4½ in. to the weather.

Under a portion of the dining room and kitchen just at the right of the open fireplace is a small cellar having a floor consisting of 4 in. of concrete, the upper inch being granolithic finish. The walls of the cellar are 6 in. thick.

The outside doors are 1¾ in. thick and the interior doors, except the leaded glass ones, are of the five cross-panel type 1⅜ in. thick. The front doors are glazed with leaded glass. The pantry is pro-

vided with double swing doors of the usual type.

The open fireplace, clearly shown in the picture on the first page of the article, is built of large boulders, those on the face being not less than 8 in. deep and laid with raked joints. The hearth is



North Side Elevation—Scale 1/16 In. to the Foot

built of flagstones not less than 3 in. thick laid in cement mortar. The firebox is lined with fire brick.

The walls of the kitchen wing around to the line of the tea room wall on the south side are covered with V-siding nailed directly to the studs.

The floors of the tea room are of narrow strips of matched edge grain hard pine. The other rooms have 1 x 3 in. dressed and matched flooring.

The interior finish of the tea room consists of a wainscoting made of ⅞ x 12 in. boards and ½ x 2 in. battens and 10 in. base. It is finished with a molded shelf cap 11 in. wide and grooved for receiving plates. Above the wainscoting the walls are panelled with Beaver board, which was given two coats of paint. The tea room has beam ceiling also panelled with Beaver boarding, as shown in the picture representing the interior. The panels are 2 ft. wide and 6 ft. long, the joints being covered with ½ x 3 in. battens.

The private dining room is shiplapped for papering. It has a wainscot of 1 x 3 in. V-cut vertically with a moulded cap 1⅛ x 6 in. wide and plain base 10 in. high. Above the wainscoting the walls are covered with canvas and paper.

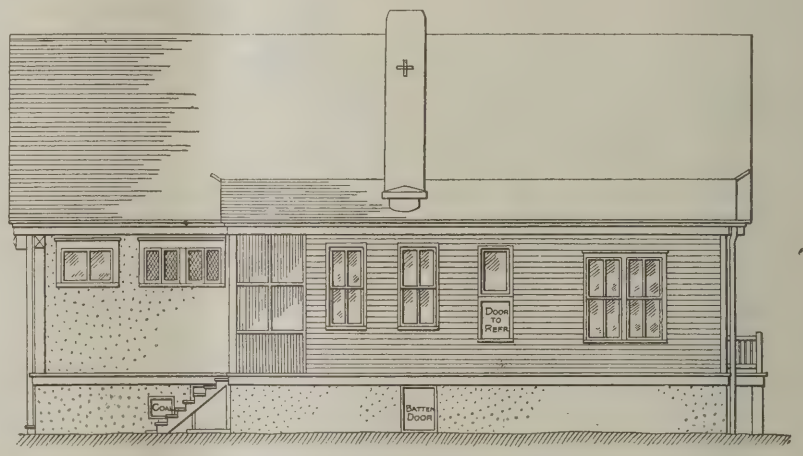
Both dressing rooms have shiplapped walls covered with paper. In the ceiling of the ladies' room is a 24 x 30 in. scuttle.

At the left of the main entrance to the tea room are three booths built of 1 x 3 in. V-cut stock and 7 ft. high with 2 x 4 in. debated cap. Each booth has double swing doors.

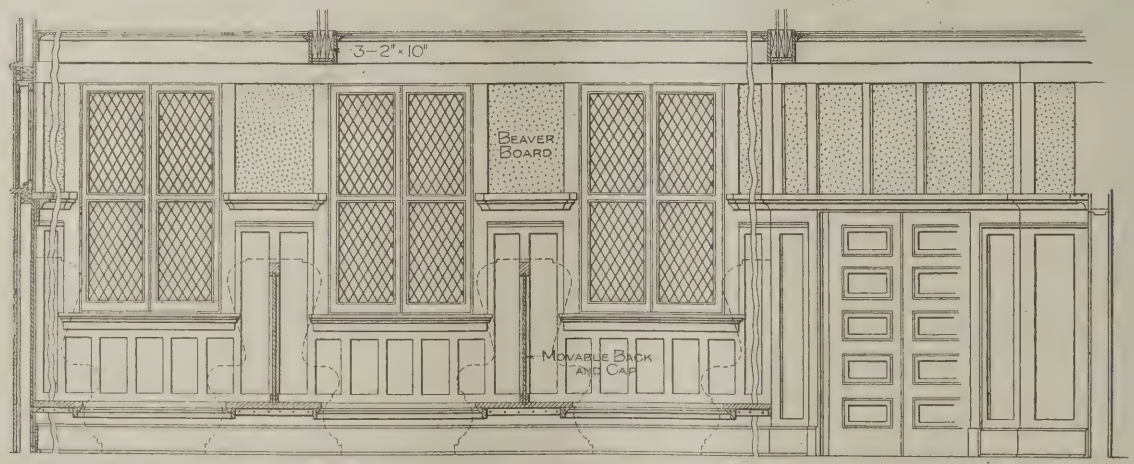
All inside casing except in the tea room is 1 x 5 in. with 1⅛ in. stool and 4 in. apron.

All woodwork in the kitchen, pantry, rear porch and storeroom was given two coats of lead and oil paint after priming. All other woodwork was given a coat of stain.

The sash and doors are glazed with single



Rear Elevation—Scale 1/16 In. to the Foot

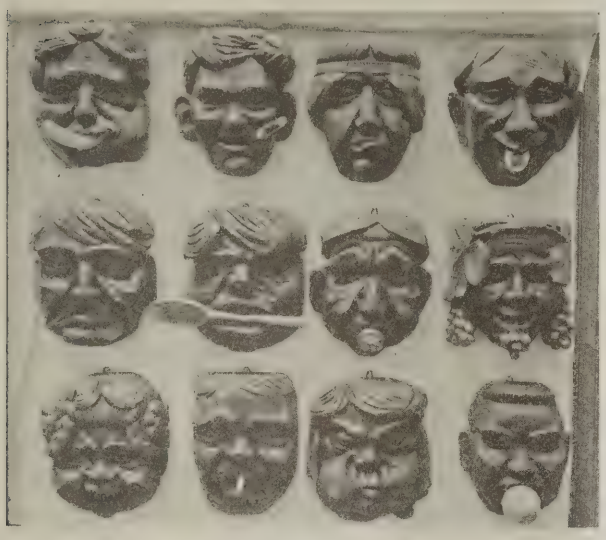


Interior of the South Wall of the Tea Room Showing Location of the Booths—Scale ¼ In. to the Foot

Two Side Elevations and Detail of the Cactus Tea Room at Austin, Texas

strength American glass, except the tea room, where the sash and front doors are glazed with leaded glass.

The building is wired for electric lighting, the work being done in accordance with the rules and



The Carvings in Wood on the Brackets of the Porch

regulations of the State Board of Underwriters as well as with the city regulations.

The plumbing includes fixtures and connections for the two toilets, two lavatories, kitchen sink and hot-water heater, with drain from the refrigerator. Gas is used as a fuel for the hot-water heater in the kitchen. In the ceiling of the kitchen is a 30 in. circular ventilator with plain hood over the top all made of No. 26 galvanized iron.

The building here shown is known as the Cactus Tea Room, located on Guadalupe Street, Austin, Tex., and was erected for Miss M. Dill and Mr. N. Brown in accordance with plans and specifications prepared by Samuel E. Gideon and H. F. Kuhne, associate architects, Austin, Tex.

The unique carvings on the brackets, an excellent view of which is shown in connection with this article, was done by Peter Mansbendel, a Swiss wood carver, who has worked in Paris and New York and now conducts his studio in Austin, his work being in great demand.

Specifications for Waterproofing

In light of the interest displayed in all suggestions on the subject of waterproofing, the following from a recent issue of the *American Roofer* is likely to be appreciated:

All waterproofing shall be on the water pressure side of the masonry. The surface of all masonry upon which the waterproofing is to be applied shall be smooth and dry.

Coat the entire surface on which the waterproofing is to be applied with special waterproofiing pitch, into which, while hot, embed a layer of special felt, following this with alternate moppings of pitch and layers of felt until six moppings of pitch and five layers of felt have been applied. Each ply of felt shall be thoroughly rubbed into the hot pitch. There shall be no pockets or blisters and in no place shall felt touch felt.

At all wall angles footings and places where the waterproofing will be subjected to unusual strain, there shall be applied one layer of tar and an additional mopping of pitch, or at least two extra layers of felt and moppings of pitch.

Where laps are left to be connected after other work is completed, they shall be not less than ten inches wide.

If waterproofing is applied from the interior to the protection walls, it shall be held in place until the foundation wall is constructed.

If waterproofing is applied from the exterior to the foundation walls, it shall be immediately protected by brick, concrete, hollow tile or similar material.

In either case there must be a continuous course of at least one-half inch of cement against the waterproofing, in order to protect the same from being punctured.

On horizontal surfaces the waterproofing shall be temporarily protected by one inch of cement mortar immediately after the felt and pitch are applied.

The number of plies of felt and moppings of pitch required depend upon the head of water to be excluded.

California's New Dwelling House Law

The new state dwelling house law which went into effect in California the first of September regulates the areas of windows and sleeping and living rooms, the height of ceilings and light courts or unoccupied areas of lots, upon which windows open. It is



The Fireplace in the Tea Room

provided that no living or sleeping room can have less than 90 square feet of floor area and the window area in each of such rooms shall be at least one-eighth of the floor area, all measurements for windows being taken to the outside of sash.

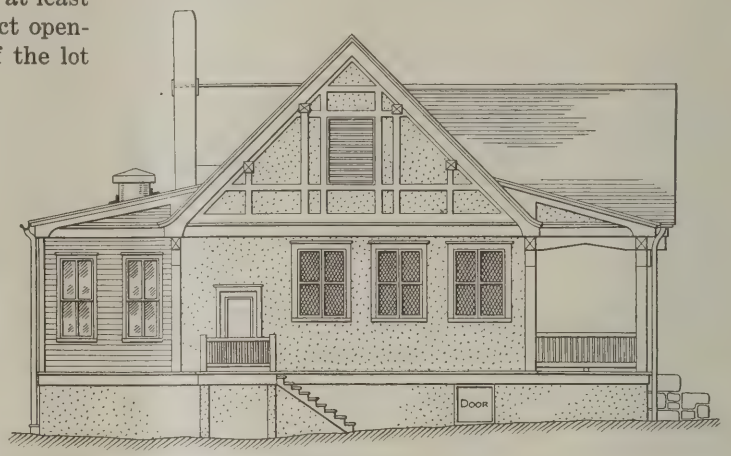
The minimum width of any such room is seven

feet and the minimum ceiling height measured between the finished floor and the finished ceiling is eight feet.

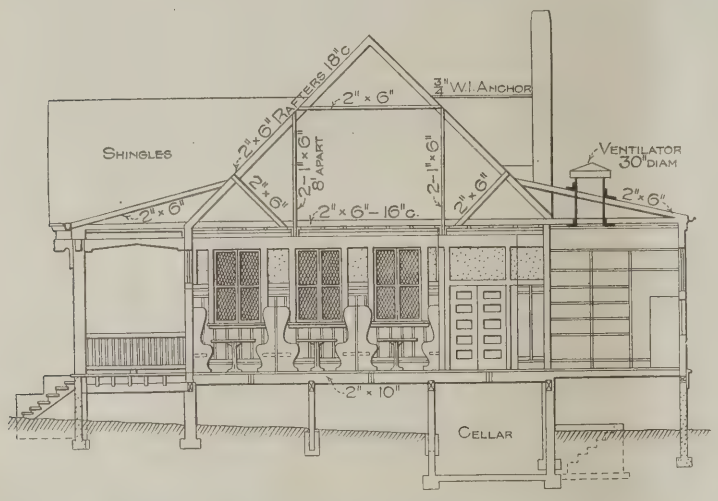
Every living and sleeping room shall have at least one window of the area prescribed by the act opening upon a street, or an unoccupied area of the lot not less than four feet in width.

The Granites of Connecticut

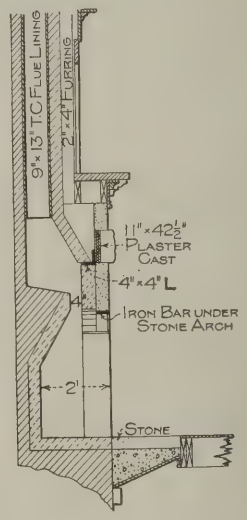
The United States Geological Survey, Department of the Interior, has published a valuable report on "The Granites of Connecticut," copies of which can be had on application. The magnitude of the granite industry of New England lends special interest and importance to this publication, which describes not only the geologic origin of the granites and their distribution, but also the principal features of the granite industry. New England granite, in the form of statuary, monuments, bridges and buildings, is found in almost every part of the United States, and even in foreign countries. In nearly all the Eastern States, as well as in cities as distant from New England as Vicksburg, Spokane, and San Francisco, in Montreal, and in Cuba, these granites may be seen in permanent structures and in statues.



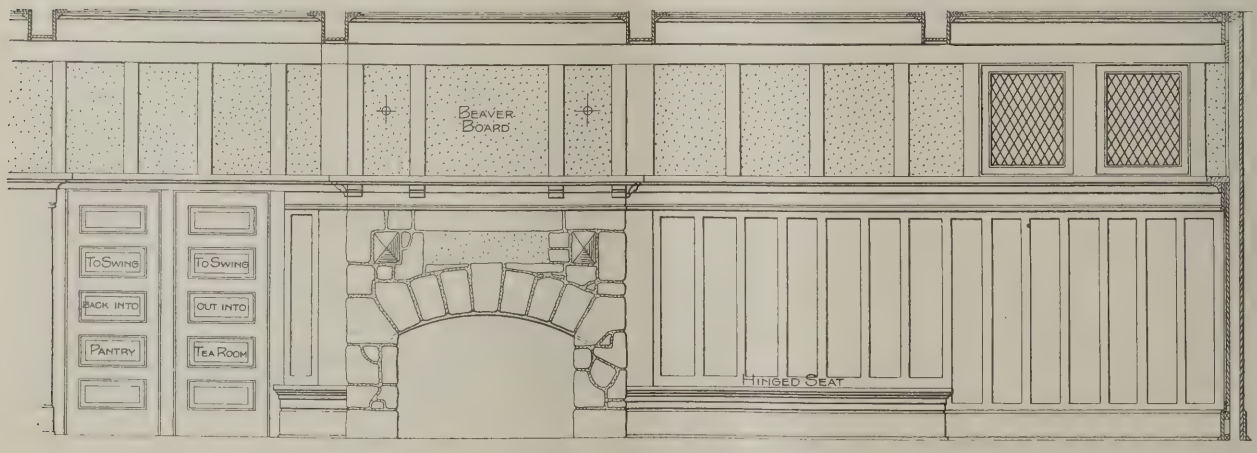
South Side Elevation—Scale 1/16 In. to the Foot



Vertical Cross Section—Scale 1/16 In. to the Foot



Vertical Section Through the Open Fireplace



Elevation of the Interior West Wall of the Tea Room—Scale ¼ In. to the Foot

Side Elevation, Cross Section and Details of the Cactus Tea Room in Austin, Texas

A Two Story Brick Business Building

Features Which Make the Structure of Particular Interest to Builders in Small Cities

BUSINESS men are gradually beginning to realize the money value of occupying a well-designed building, for it gives prospective customers a better idea of the importance and dignity of the concern with which they are dealing, and favorable first impressions are an important asset, for they put the customer in a frame of mind which tends to facilitate the work of the business man and aids him to bring transactions to a favorable termination.

The building which we here illustrate is located in the city of New Rochelle, which is not far removed from the great metropolis of the East. The firm for which the structure was built has an office in the downtown district of New York City, and is therefore cognizant of the real value of a well-designed structure to the insurance business in which the concern is engaged.



Photographic View of the Completed Building—Architect, Lawrence L. Barnard of New Rochelle, N. Y.

The exterior of the building, which is very simple in design, depends for much of its appearance upon a pleasing combination of light-colored Indiana limestone and red tapestry brick laid in a non-stain white cement.

The architectural features of the main story are worthy of careful study, for the common mistake of store design is well avoided. Only too often does the architect provide a large expanse of glass area without allowing a proper size to the supporting members, for it is necessary to so proportion the window area and the supporting members of the floor above as to give to the structure a strong, stable appearance.

The design of this building avoids the objectionable feature in a clever manner. Two side pilasters with recessed centers are combined with two engaged columns which are symmetrically placed each side of the center of the main doorway, and between which and the outside pilasters is placed the entrance doorway, thus giving four members to support the limestone cornice above.

In the upper story the brick immediately surrounding the windows is slightly recessed so as to give the appearance of pilasters supporting a beam above them. A brick and stone parapet wall lends the finishing touch to the design.

The first floor is devoted to the interests of the firm which owns the building, the entrance to the main office being at the door to the left. At the rear of this office is a small private office. A hallway communicates with a shop at the back of the building.

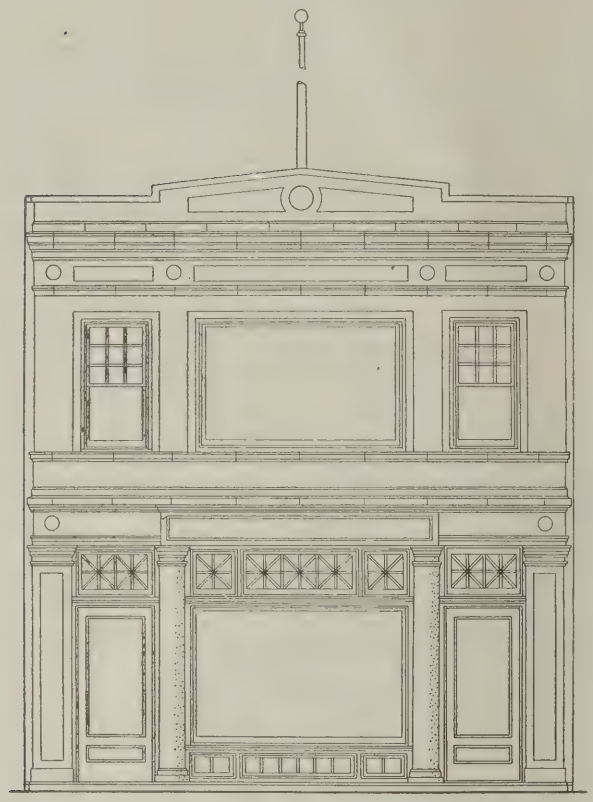
The offices upstairs are reached through a hall entered at the doorway at the right of the building. This hall is lighted from above by a skylight and by windows near the front of the building. The front part of the upper floor contains four good-sized offices. Just back of these rooms are the toilet rooms, and back of these are four more offices

arranged as shown in the floor plan presented on another page.

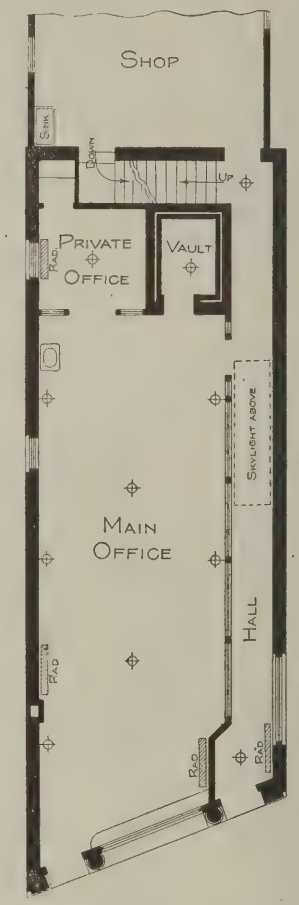
The foundation wall are built 18 in. thick of bluestone, and pointed inside and out, being painted at completion with R. I. W. waterproof paint.

The cellar floor is composed of 3 in. of concrete spanned with two pairs of angle irons placed back to back and riveted together.

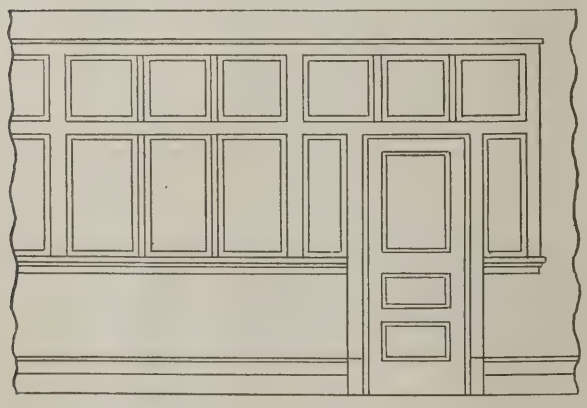
The metal work was given one coat of red lead and linseed oil at the shop and painted after erection with Dixon's graphite paint. Bolts were dipped in red-lead paint before being put in place.



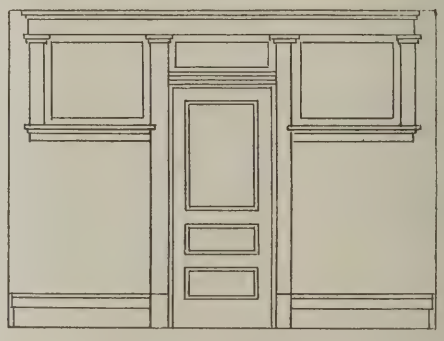
Front Elevation of the Building



Front Portion of Main Floor of the Building



Wall Treatment in Main Office



Door to Private Office with Elevated Windows Each Side

Plan, Elevation and Constructive Details of the Two Story Brick Business Building

over which was placed a 1-in. top dressing of cement and sand mixed in equal parts.

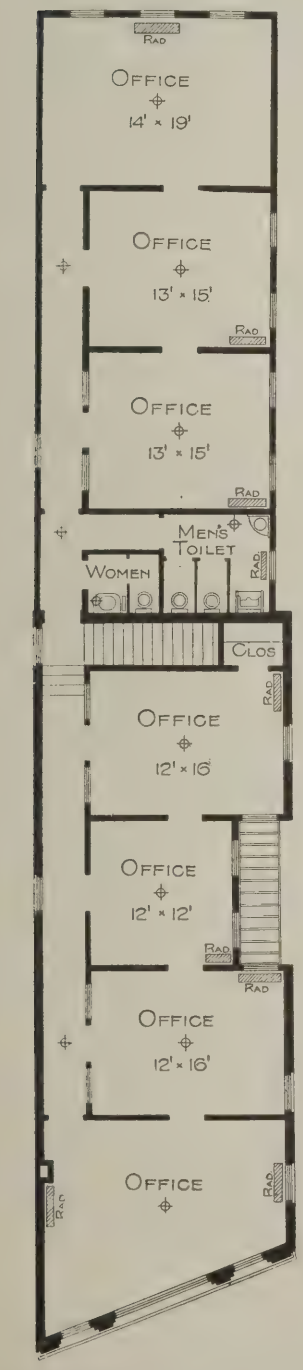
A portion of the framing is composed of structural steel. Girders built up of two or more rolled beams were strengthened by separators bolted through the web of each girder. Openings are

Where the framing is of wood, spruce was the material used. Studs are 2 x 4 in.; the first and second-floor joists are 2 x 12 in.; the second-floor ceiling joists are 2 x 4 in., hung from the roof joists; and the main rafters are 2 x 10 in., all placed 16 in. on centers. The plates are 2 x 6 in., anchored to

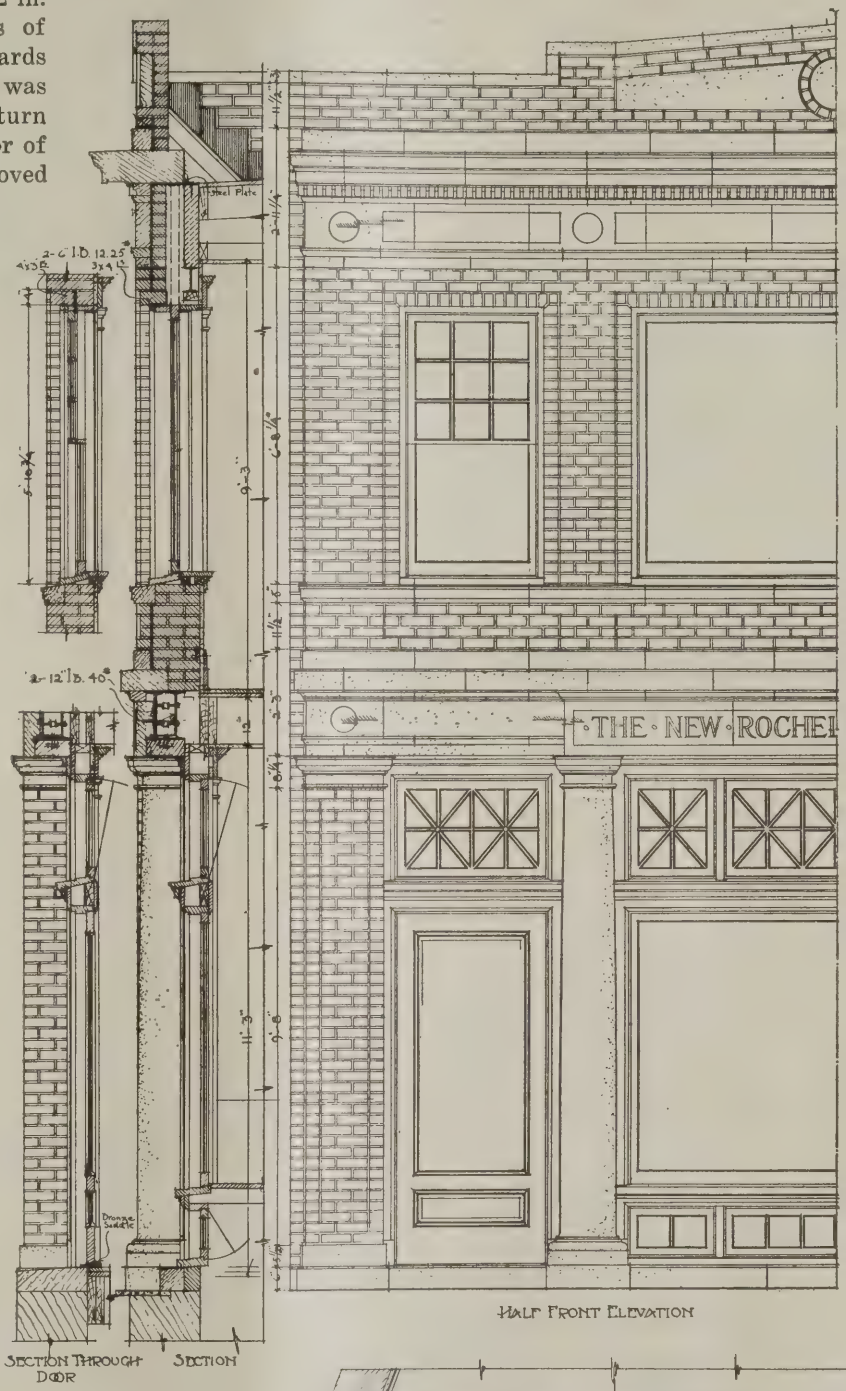
the walls, and the partition plates and studs at openings are 2 x 4 in., doubled. The herringbone bridging is 2 x 3-in. stuff, placed 6 in. on centers, and the furring strips are 1 x 2 in.

The rough flooring consists of 7/8-in. mill-planed spruce boards laid diagonally over which was placed building paper, this in turn being covered with a finish floor of 7/8 x 2½-in. tongued-and-grooved comb-grained Southern pine.

The roof was covered with 7/8-in. sheathing boards, over which was placed a Barrett 5-ply composition roofing, carried 12 in. up on all adjoining

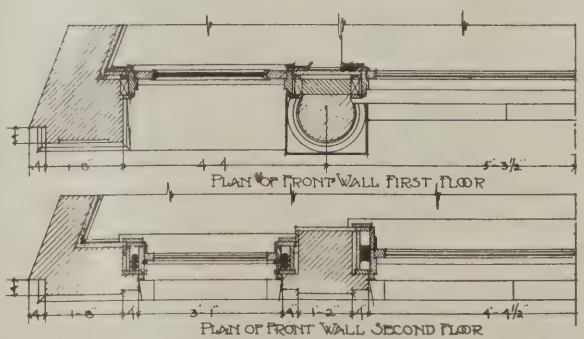


The Second Floor Plan—Scale 1/16 In. to the Foot



HALF FRONT ELEVATION

SECTION THROUGH DOOR SECTION



Details of Half of Front Elevation

Plan and Miscellaneous Constructive Details of the Two-Story Brick Business Building

vertical surfaces and cap flashed with 14-oz. soft rolled copper, which was turned down 3 in. over the roofing and built 4 in. into the wall.

The plaster was three-coat work, being applied over metal lath on the first story and over spruce lath on the second story.

Best quality white-enameled ceramic tile was used in the floors of the main hall and lavatories, and best quality white-enameled tile for the walls.

The interior woodwork is of short-leaf Georgia pine. The stairs have oak treads and Georgia pine



View in the Main Office, Showing Panel Treatment of Side Walls

risers, strings, etc. The entrance doors have bronze saddles 5 in. wide.

The building is heated by a Richardson & Bownton sectional steam heater covered with asbestos cement securely wired in place. Pressed-metal wall radiators were used in the various rooms.

The plumbing fixtures are of the J. L. Mott Iron Works manufacture.

The building was constructed for Ketcham & Goldsmith, the occupants, in accordance with plans and specifications prepared by Architect Lawrence L. Barnard of 78 Lawton Street, New Rochelle, N. Y.

Concrete Lumber in House Construction

Boards of concrete, with joists, rafters, and stair-frames of the same material, are used in the construction of a novel building in Los Angeles, Cal., the whole being set upon a concrete foundation, says the *Scientific American.* Though put together after the manner of a frame structure, the building is as fireproof and durable as the more common types of cement houses, but it requires less material and is lighter in weight.

The various parts are poured into forms on the ground near the site, and in that way the danger of breakage is eliminated. The clapboards are poured in sets of ten, the forms being securely clamped together, and the cement allowed to harden in them for several days. Then they are taken out and allowed to cure before being set up. This is done while the preliminary work is going on, such as excavating and laying the foundation.

The joists, rafters and other parts are formed in the same manner, and various types of reinforcing are used for each. The boards are reinforced with mesh like chicken wire, while the timbers have iron rods of varying thickness to strengthen them. These are allowed to project at one end in order to fit into corresponding holes in other timbers, so that the whole framework dovetails. The method of attaching the boards to the 2 x 4's is with nails, and nail-holes are bored into the cement boards before they have set by running a wire through them. As the cement timbers will not take the nails a strip of wood about an inch and a half thick is wired to the cement scantling.

Why Building Operations Should Not Be Deferred

In discussing editorially the question indicated by the above title the *Western Architect* says:

"There was never, probably, a more illogical movement inaugurated among individuals or public officers than the present disposition to hold up building enterprises because of the high cost of labor and materials. If this high comparative cost was confined to the articles and labor that enter into construction alone it would be another matter. But the fact is that, with the exception of steel, the prices of other materials are normal with the rise in every other article of commerce throughout the world.

"That these increases in themselves are abnormal and not based on actual costs does not change the totals, as, except in cases of hoped-for government regulation, this condition will last until the main cause of the stringency, the immense waste occasioned by the European war, is removed. That these conditions will increase until that time, is so near a certainty that the greatest wisdom is in purchasing at present rather than in waiting for future prices. It is, besides, most unpatriotic.

"The state, municipality or individual that declines to build when the demand would have been called a necessity in normal times, is as unfaithful to duty to his country as the 'slacker' who refuses to enlist in her defense. The need of this prosperous condition, made only through the expenditure of money in labor is greater in time of war than when the country is at peace, and any curtailment of the building business, one of the largest of our industries, is a direct attack upon the vital forces of the Nation.

"From the state government that holds up its building program to the contractor who fails to respond to requests for bids, the same charge rests of disloyalty to the interests of the country to which fidelity and allegiance is owed. But where there is no appeal to patriotism that will move, self-interest alone says, and with prophetic emphasis, *Build Now.*"



The New Army Cantonment at American Lake

The Largest "War City," as Regards Area, Constructed by U. S. Government for Its Army — Work Completed in Eight Weeks

IN our issue for last month we published an article illustrating and describing in a general way the cantonments which the Government has constructed in various parts of the country for its new army of nearly 700,000 men, and in this issue we supplement what has already appeared by somewhat extended reference to the largest of the "war cities" constructed, occupying as it does an area of 70,000 acres, and the only one west of the Rocky Mountains.

It is located at American Lake in the State of Washington, and the panoramic picture presented in sections on another page will afford the interested reader some idea of the magnitude of the work, which was completed within 8 weeks after the construction chart had been finally approved by the Government officials. It was built for the immediate occupancy of 48,000 troops and the contractors accomplished the work in what is said to have been record time, and to the "complete satisfaction of the Government, without dispute of any kind between contractors and Government or local authorities, without labor trouble of any kind, except the inevitable shifting of personnel at pay days; without accident of any serious kind to men or materials and without sickness among the host employed."



Appearance of a Two Hundred Men Barracks, Bath House and Lavatory and a Warehouse During Process of Construction

The contract for the work was awarded to the Hurley-Mason Co. with offices in Tacoma, Seattle, Portland and Spokane, and the chart indicating the number of buildings of each type to be built was put into their hands July 2; was modified July 5 and finally approved July 10. The new army was expected Sept. 5, and in the eight weeks thus allowed the gigantic task was completed.

Location of the Camp

The cantonment at American Lake is called "Camp Lewis," in honor of Mariweather Lewis of the historic Lewis and Clark Expedition, which held the great Pacific Northwest to the domain of the United States. Camp Lewis includes four brigades of infantry, one of heavy artillery, one of field artillery, engineers' regiment and train, supply train, ammunition train, signal corps, headquarters buildings, hospital corps, and remount stables.

The cantonment is built in the general shape of a U, the size of which is indicated by the fact that the service railroad, running from one tip of the U around the base to the other tip, is five miles in length. Streets in the cantonment are laid out in orderly fashion and numbered, and each building carries its number and designation corresponding to its use. The buildings are of several types, and include barracks for the soldiers, officers' quarters, mess houses, storehouses, lavatories attached to each building, stables and sheds.

The Number of the Buildings

The number of buildings and their use is indicated as follows:

Infantry	504
Division Headquarters	9
Brigade Headquarters	24
Field Artillery	246
Engineers	29
Signal Corps	10
Headquarters' Train	8
Ammunition Train	18
Supply Train	8
Engineers' Train	4
Sanitary Train	24
Heavy Artillery	228
Telegraph and Signal	8
Extra Buildings	28

These 1,148 buildings constituted the original plan; but to them have since been added the fifty-eight buildings of the Hospital Group, and approximately 200 Remount Stables.

Style of the Construction

All of the buildings are of frame construction. The baracks and officers' quarters have double floors with paper lining; the walls are ceiled on the inside, and covered with building paper and siding on the outside. Two-ply roofing paper is used throughout the construction. The windows are sliding, and doors and windows are all stock size. The warehouses, stables and other buildings of that kind are finished on the outside with one-ply roofing paper with battens. The hospital buildings are of a better class of construction and have wall-board partitions in ceilings, whereas the partitions in the other buildings are ceiled.

On a work of such magnitude, with everything to be completed and in readiness within so short a time, it was necessary to attack virtually every part of the undertaking at the same time. While the buildings were under construction, work was also in progress on the improvement of the site, road building, installation of the water system and sewer construction. The generally level character of the cantonment site made little grading necessary. Ten sawmills, established by the Hurley-Mason Company just outside the "legs" of the U, turned all the lumber into proper dimensions, and this was delivered at the exact point of use by rail or auto truck.

The Sewage and Water Systems

Meanwhile work proceeded on the sewage and water systems. The water for the cantonment is taken from five great springs, located west of American Lake. From these springs the water is pumped a distance of approximately 12,000 feet, through two ten-inch lines of wood stave pipe, to the three 200,000-gallon wood tanks, located on a hill, giving a head of about 125 feet. The water then flows by gravity through two independent lines of pipe, starting with 14 in., then 12 in., then 10 in., and so on, reducing in size. There are in use, approximately, the following lengths of each size of pipe:

14-inch	20,415 feet
12-inch	10,000 feet
10-inch	30,320 feet
8-inch	2,600 feet
6-inch	20,000 feet
Small iron pipe	50,000 feet
Total	133,335 feet or 25 miles

Sewer System Is of Permanent Construction

The sewer system, like the water system, is of permanent construction. Terra cotta and concrete pipes have been used, ranging in size from 6 in. to 30 in., and roughly divided as follows: 50,000 feet of laterals on the South Trunk; South trunk proper, 7,700 feet; North trunk laterals 44,384; North trunk proper, 8,452. These two trunk lines empty into the outflow sewer, 15,725 feet in length, crossing the highway and the main railroad line near the American Lake station, and thence crossing private property to a point on Puget Sound, where it is carried to deep water, making a total of 126,261 feet, or twenty-four miles of sewers. The small picture at the top of the first page of this article shows the men laying the 24-in. sewer.

The cantonment, streets and buildings, is lighted by electricity. Electric current is purchased from the Puget Sound Traction, Light & Power Company and is distributed throughout the cantonment on government poles.

The Methods of Heating

All of the barracks are heated by stoves; the officers' quarters are heated by individual steam plants, and the hospital buildings are all heated from one central steam plant.

The materials used in the construction of this cantonment have come from all parts of the United States. Inasmuch as the buildings are all of frame construction, the biggest single requirement in the way of material was lumber; and lumber being one of the biggest basic resources of the Pacific Northwest, the local product was used. The lumber for



Three Sections of a Panoramic View of Camp Lewis, at American Lake, Wash., Looking Across the Great Parade Seen in the Background

the cantonment was purchased through the Fire Emergency Committee in Tacoma, as were also the sash and doors, including glass. The Government made contracts in Washington, D. C., for much of the other material, and instructed the Hurley-Mason Company to send in confirmatory orders. All of the cantonments were taken care of in this way, so that those nearest to sources of supply were not permitted to interfere with the supplies of those farther distant.

Where Materials Were Purchased

Except where the contracts were made at the National capital, materials of all sorts for Camp Lewis were purchased as near to the work as it was possible to procure them. Labor for the construction of Camp Lewis was obtained, in the first place, from Tacoma, the nearest city. When that source was exhausted, the Hurley-Mason Company reached into Seattle, Spokane, Portland, and even as far as San Francisco, to get the number of men necessary to complete the work on time. The work began with approximately 5000 men employed, but the number steadily increased until it reached a maximum of more than 10,000 men. Eight hours constituted the day's work, and the standard scale prevailing in Tacoma at the time the contract was awarded prevailed throughout the period of construction.

The Organization Was Efficient

A very complete and effective system of organization was naturally required in order to carry on the big undertaking and turn the cantonment over to the government, ready for occupancy, within the time allowed. The Hurley-Mason Administration Department dealt directly with the Army Administration, represented by Major David L. Stone, U. S. A., constructing quartermaster. The plans for all the work were furnished by the government and the entire construction was under the charge of Major Stone, to whom great credit is given for administrative ability, good judgment, and practical commonsense, by all with whom he has had to deal in the course of the work. The Contractors' Administration Department directed and controlled the activities of all other necessary departments, as Auditing, Quantity Survey, Building, Sewers, Plumbing, Heating, Lighting, Water, and Commissary, out from, and inter-related with which, were the Labor Bureau, Information Bureau, Time Keepers, Purchasing Department, Plant and Plant Transportation and Repairs, Stores and Transportation and Bookkeeping.

Efficient Work of Major Stone and His Staff

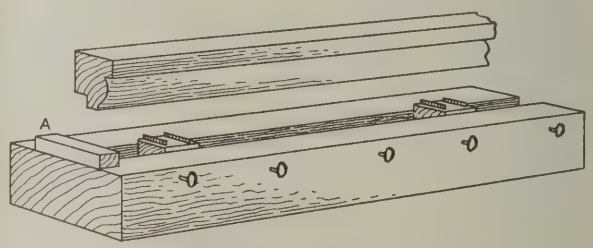
Without the co-operation of Major Stone and the officers assisting him, and the close co-relation in the workings of all the Departments of the Hurley-Mason organization, the work at Camp Lewis might have been seriously delayed and perhaps not completed within the time allowed. Major Stone was ably assisted by specialists in their various lines. The sewer and water systems were under Engineer W. J. Roberts; buildings under Captain Louis M. Lang and Captain Charles H. Alden; electric light and power under Captain James S. Irvine; the surveying under Captain Howard M. Smitten; while, due to the vigilance of Captain Eugene G. Northington, there was absolutely no sickness during the construction of the cantonment.

Device for Laying Out Sash

That there is a demand for a quicker method for laying out, or marking, the mortises in sash, seems to be indicated by the number of times some variation of the subject of the accompanying sketch is noticed, says the *Wood Worker*.

The ordinary method of indicating mortises on a sash is to fasten a number of stiles together with a handscrew, and mark out the mortises with a square and jack-knife, which is slow and cumbersome. With the simple arrangement shown, the sash material may be marked as fast as it can be picked up, and much more accurately than by the old method.

It consists of a block about 3 in. square, long enough to accommodate the longest stiles, and



A Device for Laying Out Sash

plowed through the center about ¾ in. in depth and 1 in. in width. In this groove are fitted two or more blocks that slide easily, yet without too much play. In these blocks are fastened two thin strips of a band saw, placed the exact width of the mortise apart, and filed sharp on the upper edge.

These blocks can be readily moved and fastened at any desired distance from the end, by means of small iron setscrews. The operation of marking the sash consists simply in butting the end of the stile against the block marked *A* and pressing it down on the sharp steel cutters.

From the Court of Appeals of California we have a decision to the effect that where a building is completed pursuant to contract, an architect's certificate may not be rightfully refused, and the contractor may recover a balance due him without presenting it, in a case where the property owner has waived previous certificates from the architect.

"The Fight Against Fire" is the title of an address by F. H. Wentworth, secretary of the National Fire Protective Association, of Boston and delivered before the fall meeting of the Portland Cement Association in Chicago. This address is being sent out in pamphlet form by the Cement Association.



Some Echoes of the Noon Hour—III

By Edward H. Crussell

In This Discussion of "Efficiency" the Author Introduces Some Freehand Sketches of the Various Personages

"WELL," said Shorty, as he crumpled and threw away the stray sheet of paper he had been reading; "I suppose I have lots of other things to be thankful for, but I hardly ever pick up a newspaper or magazine nowadays without offering thanks that I'm not a bricklayer. Ever since some fellow found out that it would be cheaper to have the laborers turn the bricks right end to before taking them to the bricklayers, everyone who has dipped his pen in the ink, in order to give us a few pointers on the much advertised subject of efficiency, seems to have taken them as the horrible examples, and people who don't know different (and there's a lot of them) must think that before these efficiency sharps came along, the bricklayers got their money for passing a brick from one hand to the other and showing that there was nothing up their sleeves, like a conjurer in a side show.

"Efficiency" from the Workman's Viewpoint

"Of course, efficiency is a very fine thing and I'd like to see some of you a little more inclined that way, but there's an awful lot of bunk written in the name of efficiency. Take that piece I was just reading; it tells about one of these experts being shown through a factory. Thinking to surprise him, the guide took him to where a girl was wrapping boxes of the finished product. 'Did you ever see anything to beat that?' asks the guide, and Mr. Expert takes out his stop watch, watches the girl for a few moments, and then shows how, by eliminating some useless motion, he can wrap the cans faster than she can.

"I don't remember the exact words and it isn't necessary, because I wouldn't believe it if I saw it. I know it's a lie; so do you; so does anyone who ever saw an expert packer wrap a can. Not by eliminating all useless motion, and some of the necessary motion could he do it, any more than he could climb up onto a roof and show Bliss here how to lay shingles; or take Scotty's file away from him and show him how to file a saw. And, apparently, all they tell the yarn for is so that they may have a chance to bring in this old story about the expert and the bricklayers; it makes me sick.

Where "Efficiency" Would Work Well

"I've known plenty of bricklayers, and plenty of other workers, who might have been some better (and couldn't possibly have been any worse) for a few applications of efficiency, just the same as I've known plenty of them who were already as efficient as any ordinary man ought to be, and I think it about time someone's attention was drawn to the fact, that these efficiency experts are only humans like the rest of us, and just as likely to be in need of some of their own medicine." Having said which, Shorty took out a match and gave his attention to his pipe, which had been somewhat neglected in the excitement of his outburst.



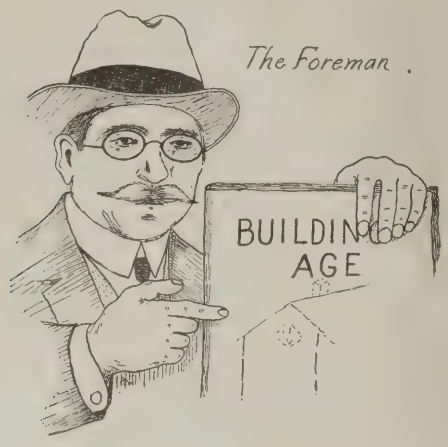
"Gee!" sighed the Kid, "I wish I could talk like that; I know where there's a hall for rent cheap."

"Yes," agreed the foreman, "that was quite a spiel, that sounded a good deal like the Beanville debating society. I think Shorty must have read it somewhere and is trying to pass it off as his own."

Shorty having denied this with some vehemence, the foreman continued: "I've often found myself thinking along the same lines, but as soon as one stops to consider he at once realizes that there's nothing to get excited about; such things as this are not written by the efficiency people, but by some space-filling news writer. The expert knows, just as well as you or I, that it is the practice of efficiency, and the elimination of waste motion, that makes the expert packer, shingler, or saw filer. If Bliss here can put on a few more shingles than the rest of you, it's because he has a good reason for

every move he makes,, and the best of the efficiency sharks will not be able to show him how to eliminate any of them to advantage."

"Thanks, Boss, thanks," said Bliss with a grin, "I'm much too modest to say that for myself, but it



gives me great pleasure to indorse your remarks."

"And the same may be said of Scotty's saw filing," the foreman went on; "elimination of all useless motion, constant practice and a liking for the work is what makes Scotty the saw-filing wonder which he is."

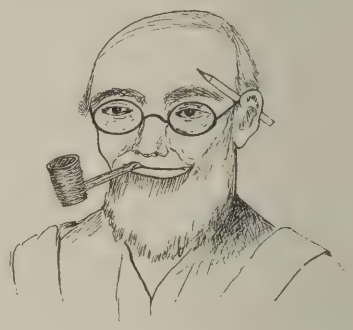
"I'm sorry I can't agree with you there, Boss," said Scotty; "you may be right on the first two counts, but if you think I like saw-filing I'm surprised at how well I've been able to disguise my real feelings about it. I'd rather do almost anything than file a saw and the only reason I file my saws is because I've never been able to get anyone else to file them to my liking. No, if I'm a little faster at fitting up a saw than the rest of you, I think you'll find it's because I dislike the job so much that I use all the speed at my command in order to get done with it as soon as possible."



"When you fellows get done with your autobiography," broke in Shorty, "I'd like to point out that you've evidently missed the main point of my talk entirely. What I want to know is, what good does all this talk of efficiency do? Is the average bricklayer, packer or shingler any faster or better because of it? I think not; I think you'll find that there were just as many fast workmen in these lines before efficiency was so much talked of, which proves, to me at least, that the good men don't need to be taught efficiency, and that teaching it to the poor workmen will not make them any better, because they never pay any attention to it."

"Oh, thunder!" said Old George, "what do you want to make a break like that for?" And he quoted the saying of a cockney laborer, which had become a classic in the gang a few months before. 'Fust you goes an' you makes a gun as'll drive a bullet through anythink, and then you goes an' makes a ship, as there ain't no gun on earth can drive a bullet through.' In other words, first you prove that the talk and writings of the efficiency experts do no good, and then you say the reason is, because the men who need this information do not pay any heed to it."

"That, of course, is the chief trouble with all information," said the foreman. "The more we need it, the less we think we need it, and the harder it is to get us to pay any attention to it. Along this line, I'd like to make a few remarks, prefacing them with the statement that nothing personal is meant and present company is not concerned. Each one of you has been selected from a large number of others because you could do something they could not. Your employment here is sufficient proof that you have been found worthy, and if you find anything in what I have to say which appears to you to have a personal reference, don't give yourself away by mentioning it.



"Most of us judge of our own efficiency, by comparing it with the efficiency of our neighbors. If we can beat the fellow next us in doing some particular thing, we are quite satisfied and let it go at that, without bothering to find out whether it is the best we can do or not. Consequently, most of us have latent possibilities which, if we could only call upon them in the time of need, would make our daily toil easier, increase our self respect, and give us a better standing in the community where we live.

"Some of the things I shall mention only mean the loss of the fraction of a second and you may think them not worth considering, but a great many world's records depend upon the fraction of a second, and anyone able to clip a fraction of a second off an existing record is sure of a lot of free advertising.

"Take the matter of nailing; any of you would be willing to admit that you were efficient in the use of a hammer, yet how many of you would have to plead guilty to the common fault of tapping a nail two or three times with a hammer before letting go of it? In toe-nailing this is often necessary, but for straight nailing one tap of the hammer is enough to start the nail, after which the fingers should be removed from the danger zone, in order that the fear of hitting them may not lighten successive blows. I see some of you grinning at that; very well, how many of you can drive this tenpenny nail through an inch board with one blow of the hammer?"

Several of them tried and then the foreman remarked: "Yes, now it's my turn to grin. I didn't mean that way; anyone can drive a nail an inch with the second blow; what I meant was to drive it an inch with the first blow, without any preliminary tapping; like this."

Driving a Nail an Inch With a Single Blow of the Carpenter's Hammer

And picking up nail and hammer, with the first blow he drove the nail through the one-inch rough board on which he had been sitting, so that it stuck out a quarter of an inch on the lower side. This created more interest in the experiment and after one or two of them had battered their fingers, the foreman said: "You see, what I told you is true; you judge of your own efficiency by that of your neighbor's, and are quite satisfied with it until you find him doing something which you cannot; then you start in to practise in an effort to catch up. However, driving a nail an inch with the first blow is not the utmost of nailing efficiency; I knew a lather who could drive a lath nail clear to the head with one blow and he did it regularly when nailing the ends of his lath. If you practise until you are able to do this, you will have the satisfaction of knowing you can do something that I have never been able to do.

Handling Nails With the Left Hand

"Another thing is the handling of nails in the left hand. Anyone calling himself a carpenter should certainly be able to bring the nail into position with this hand alone, and yet you'd be surprised at the number of times I notice someone reaching the right hand over to reverse a nail that is held in the left. Some men have the time-wasting habit of carrying their nails in the wrong pocket. Imagine how you would feel if you were paying a man the union scale for laying flooring, and every time you looked at him you saw him lay down his hammer, take the nails out of his pocket with his right hand, pass them over to his left, pick up his hammer and go to nailing again."

"I know who that was, Boss," broke in Shorty, "but I've got a good excuse; there was a hole in my nail pocket."

Where to Put Nails When Laying Flooring

"I said for no one to give himself away," laughed the Boss. "But since you've mentioned it, I might say that when laying flooring I never used to carry the nails in my pocket; my method was to leave them in the keg, or turn out a few heaps on the floor where they could be easily picked up. I do not insist upon this method, because when used by a workman who is not in sympathy with it, it can be made more time-wasting than carrying the nails in the wrong pocket.

The Moral of a Fairy Tale

"That matter of a hole in the nail pocket is another thing that might be mentioned. Many a man has received a black mark because of it. I remember a reproof that an old boss of mine handed to one of my workmates. 'Smith,' said he, 'did you ever read that fairy story about the wicked uncle who tried to lose two small children in the wood, but couldn't do so, because one of them filled his pocket with small white stones which he scattered along the way and thus was able to find his way home again?' Smith replied that he had no time to fool away on fairy stories. 'Well,' said the other, 'I just want to warn you that if you should take a notion to commit a robbery, or a murder, or anything like that, you'd never be able to hide yourself away; even a policeman could track you by means of the nails you scatter out of that hole in your pocket.'

"Well, I had a lot more that I wanted to tell you, but I'll have to leave it till some other time. I'm glad to see you were so interested in my little talk; even forgot to tell me it was one o'clock and time to start work."

(To be continued)

Death of Theodore Starrett

In the death of Theodore Starrett, which occurred at the age of 52 years at his home in Prospect Plains, N. J., on October 9, the building world has lost a conspicuous member. He was born in Kansas and came of a family noted for its big building and contracting operations and he naturally followed the family bent, soon to become a power in the building world. His brother, Major W. A. Starrett, is chairman of the committee on building construction of the Council of National Defense, under whose direction the big army camps and cantonments were built. Paul Starrett, also a brother, is president of the George A. Fuller Company, a skyscraper construction concern, and his other brothers, Goldwin and Ralph, are respectively members of the firms of Starrett & Van Vleck, architects, and Starrett & Goss, building contractors.

Coming to New York about twenty years ago, Theodore Starrett founded the Thompson-Starrett Company and at once blazed the trail for the myriad skyscrapers that have been erected here since that time.

Besides his brothers, he leaves a widow and two sons, Robert O. Starrett, in business in Nevada City, and Sergeant Theodore Starrett, Jr., stationed at Fort Shelby.

A Question of Chimneys

Some builders and architects know but there are many who do not know that the new Building Code of New York City provides that builders who build higher than the adjoining buildings are obliged to carry up the chimneys of that building to the height of the new building. This ordinance places no small contract upon the man who erects a twenty-story building alongside of a five-story neighbor.

Hints on Repairing Door Panels

A Method Described by an English Builder Which May Interest American Readers

ONE of the most general causes of door panels splitting up the middle is the improper fixing of the moldings; the nails being inserted so that they pass through a portion of the panel into the framing as indicated at "A" in Fig. 2, whereas the molding should be secured to the framing only, as indicated at "B" in that illustration, says a writer in one of our London contemporaries. It will be seen that in the former case the panel has no chance of shrinking a little in the plough groove; hence the splitting. Another cause of splitting is the fitting of the panels too tightly into the plough grooves, where they are held so firmly that they split.

To repair a split panel in which the split is not of long standing, and in which, when the parts are forced together, a fair joint will result, it is necessary to first carefully take out the moldings from each side, then make six or eight blocks and wedges similar to those shown in Fig. 1 and screw the blocks to the panel as indicated, taking care to keep the screw-holes in the panel so that they will be covered by the moldings. Then by carefully levering with a chisel and lightly striking the wedges, the parts of the panel can be forced together. If the result of the trial is found to be satisfactory, the wedges can be released, the crack opened and some good glue run in.

The wedges are then tightened and the parts forced as close as possible, any superfluous glue being carefully washed off. After the glue is dry any projecting parts may be removed by means of a sharp scraper and glasspaper; then the moldings can be replaced.

Another method which, in certain circumstances, would be the only satisfactory one, is as follows: Take out the molding at the top and bottom of the panel (this being necessary on one side only) and set out as shown in Figs. 2 and 3. Fig. 2 represents a section through a portion of the panel and Fig. 3 a portion of the elevation, "B" showing the crack.

On one side make the distance, indicated by the solid lines marked *a-a*, less than the distance *b-b*, indicated on the other side by dotted lines. These lines having been drawn on each side, the superfluous wood should pe pared off exactly to the lines, forming a dovetailed opening. Next prepare a strip of wood so that it fits in as indicated in Fig. 6. It will be noticed that it is necessary to notch each end out just between the moldings at the top and bottom on that side where the moldings have not been taken out.

The arrangement being satisfactory, secure the strip with glue, taking care to keep the two parts of each surface of the panel in the same plane. The whole should then stand, to allow of the glue setting

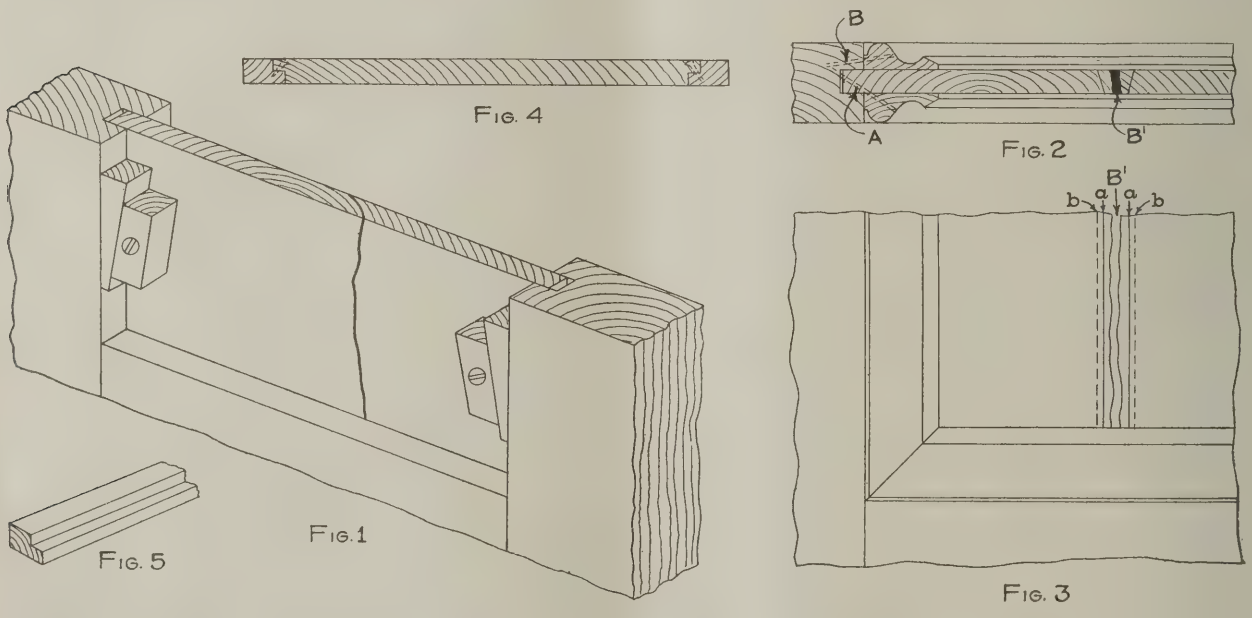


FIG. 4 FIG. 2 FIG. 1 FIG. 5 FIG. 3

Various Illustrations Showing the Manner in Which the Work of Repairing Door Panels May Be Conveniently Carried Out by the Workman Clever in the Use of Tools

thoroughly. After this the strip may be cleaned off on each side flush with the panel, a small iron plane being extremely useful for this purpose; and after

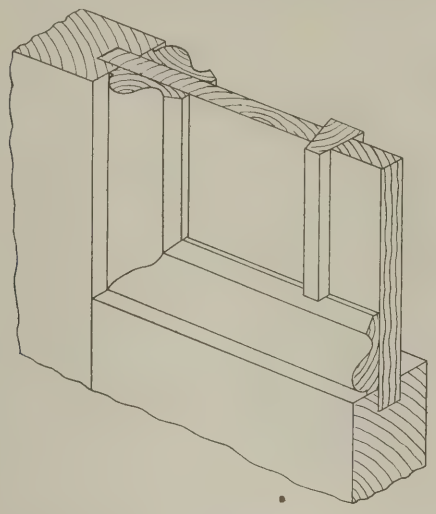


Fig. 6—Showing Strip of Wood Fitted in Panel of Door

being finished off with fine glasspaper, the pieces of molding may be reinserted.

Sometimes a panel may be so much damaged that it must be replaced, and in some cases, especially with good doors, it is objectionable to take off the stiles because of the liability to spoil the latter and the rails, particularly where the joints have been well glued and wedged together. The method about to be described will obviate these objections and produce a good sound job: First take out the moldings on each side of the panel, and cut out the panel. This may be done by making a hole with a brace and bit and sawing down a short distance with a

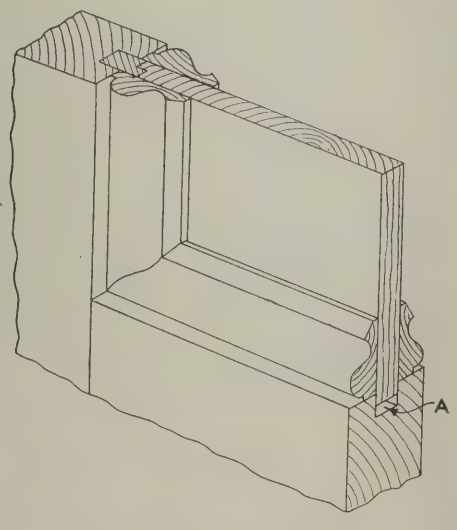


Fig. 7—Showing Treatment of the Plough Grooves

pad saw, the remainder being cut with a panel saw.

The main portion having been taken out, the pieces can be removed from the plough grooves with a chisel. Now make a new panel in the following way. Prepare two strips about ¾ in. wide and the same thickness as the panel as shown in Fig. 5.

Next prepare the panel, and rebate this and the strips together as shown at Fig. 4, so that when they are put together their combined width will be exactly the same as the distance between the plough grooves of the stile and muntin. Next fit the rebated fillets into the plough grooves, and cut off the panel to length. It is not possible to cut it off long enough to go the full distance into the top and bottom plough grooves; but if it is cut off the length between the rails plus the depth of one plough groove it will, when put in position, be of sufficient length to extend half-way into each plough groove, as indicated at *A* in Fig. 7.

When found to fit satisfactorily, the panel may be slipped out, and its rebated edges and also those of the fillets being glued, it may be pushed back into its proper position, care being taken that at the top and bottom it extends into the plough grooves.

Additional security may be obtained by inserting a few fine screws diagonally as indicated in Fig. 4. When the glue is dry, the joints may be cleaned off with a small rebate plane. Of course, very little of this will be necessary if the parts have been carefully fitted.

The moldings may then be reinserted, and the job thus completed as far as the joiner is concerned.

An Inexpensive Sun Parlor

A very inexpensive sun parlor has been recently added to a suburban home by inclosing with glass a small second-story bedroom porch, the only furnishings of which are a cot, a small drop-leaf kitchen table and one comfortable willow armchair, says Virginia Earle in the Philadelphia *Public Ledger*. If there is any porch already a part of your home all or part of which can be inclosed with glass for use in winter months, or if you can possibly afford to build out from some room, in the event that you have no porch, a really-truly sun parlor, you are robbing yourself and your family of one of the greatest delights of a home if you fail so to do. If you are planning to build a home and omit from your scheme some kind of a sun parlor or glass-inclosed porch, that is truly a sin.

How the Building Situation Is Regarded

It seems to be the opinion of a great many of those prominently identified with the building business that now that prices of various forms of steel have been fixed through co-operation rather than through compulsion, a more hopeful sentiment prevails as to the outlook. Some go so far as to express the view that we are on the even of a strong building revival as costs can now be figured with some degree of certainty. Of course the Government's requirements will receive first attention, but where building operations are in prospect involving only a very small amount of fabricated steel, it would seem that reasonable deliveries might be expected.

A Poultry House for the Farm

A Building Planned to Accommodate 200 Chickens—Various Details of Construction

THE subject of the small poultry house is one of never ending interest to the builder located in suburban districts, for the requirements of utility, economy, and attractiveness are as important in a farm building as in a more pretentious structure. The poultry house which forms the basis of the present article faces east and has a length of 20 ft., a width of 16 ft., and a height of 8 ft. Plenty of light and ventilation are provided by large windows which are located on the east and south sides of the building, as a glance at the accompanying illustration will show.

The building is intended to afford accommodations for from 175 to 200 chickens, 10 roosts and 24 nests being provided. An addition at the left or west side of the building, 8 x 20 ft. in dimensions, provides a scratching pen in the winter and serves as a brooder run in summer. The basement is used as an incubator house during the summer and is utilized as a sort of wood working shop in winter.

The foundation walls are of stone and the framing timbers are of hemlock; the sizes of some of the principal members are as follows: Posts, 4 x 4 in.; rafters, studs and wall plates, 2 x 4 in.; collar beams and the sills 2 x 8 in.

The building was sheathed with 1 x 8 in. boards over which was placed white pine drop siding, painted white. The roof is covered with red cedar shingles exposed 4½ in. to the weather. The floors are of 1 x 6 in. dressed and matched flooring.

The building is heated by means of a stove in the basement, a pipe running up through the hen house.

It is located on the farm of J. E. Rouspiez at Juda, Wis.



Poultry House on the Farm of J. E. Rouspiez, Juda, Wis.

In order to keep pace with the active demand for housing accommodations for automobiles throughout the city and vicinity, the general contract for a two-story reinforced concrete structure to be erected at 310 to 328 West Thirty-eighth Street and running through to West Thirty-seventh Street has been awarded to the Long Acre Construction Company, New York City. The new building will contain 67,750 sq. ft. and will house 250 trucks. It is expected to be ready for occupancy by January, and the estimated cost is placed at $300,000.

One Story School Buildings Discussed

By

Wallace B. Conant

THE single - story schoolhouse is a somewhat novel type of construction that has a number of obvious merits. These are superior safety, a better control of pupils by their teachers, and lower maintenance costs, as compared with school buildings of two or more stories in height.



New School at West Concord, Mass.

Obviously, the one-story school building is especially adapted to suburban and other smaller communities, where land is comparatively inexpensive. A number of such structures have been erected in New England and New York State during the past few years.

In general, the building is simply a group of classrooms forming a continuous row, or grouped about a central hall, each room having a door leading directly outside. The roof is of the saw-tooth type, with a false attic below, which is a wireglass ceiling covering the greater part of the area of the room.

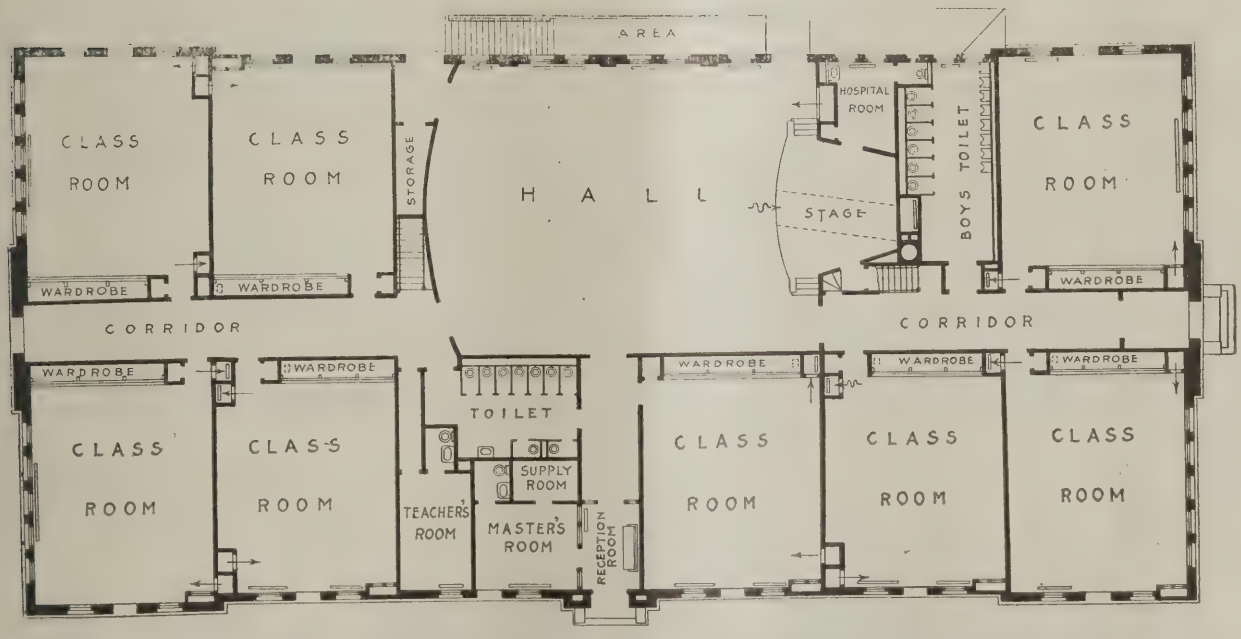
A grammar school at West Concord, Mass., now in process of construction, consists of eight classrooms about 23 by 30 feet, and having 44 seats and a hall 39 by 55 feet capable of seating 360 persons. There are also a reception vestibule, a masters' and teachers' rooms, and toilets for boys and for girls, all on this floor, while in the basement, only a part of which will be finished, are a playroom together with a heater and fuel room.

The main floor is an almost perfect rectangle 163 ft. 8 in. by 77 ft. 4 in. Each classroom is provided with a clothes closet having sanitary drying equipment, and the hall has a large stage.

Foundations, walls and footings are of concrete, the specifications prescribing one part cement and 2½ parts each of ½ in. and 1½ in. stone and of sharp sand. Admirable aggregate was found in excavating, and this was used without separating the sizes, a small "Rex" concrete mixer being used.

The stonework consists of a granite grass course, steps and doorsills, and trimmings are of Indiana limestone set in stainless Portland cement mortar, one part lump lime to three parts of cement.

Face brickwork is of tapestry brick selected by the architects, for which $26 per 1000 is allowed,



Floor Plan of New School at West Concord, Mass.—Architect, W. H. McLean, Boston, Mass.

f.o.b. Concord. The color of the regular brick is buff, a darker brick being used around window and door openings. All brick is set in black mortar composed of 1½ parts cement, one part slaked lime and 4 parts coarse sand. The thickness of bed of mortar is about ¾ in. About every tenth course is laid with Flemish bond, and about every fifth course is bonded with 10 in. Morse galvanized wall tiles.

The Exterior Walls

The exterior walls from the top of the first-floor joists to the ceiling are backed up with best dense, hard-burned 8 in. by 4 in. by 12 in. tile, with 4 cavities. These are laid horizontally in mortar, 2 parts cement, one part lime, and 4 parts coarse sand, and are bonded to the facework at each five courses with a Flemish bond. Slabs of full width of the tile 1 in. thick and 12 in. long are used to even up the courses.

The floor timbers are of prime Georgia long-leaf pine. A 4 in. by 8 in. wall plate is placed all around the building on the exterior walls, bolted to the walls every 5 ft. and at all corners and valleys with ¾ in. by 2 ft. bolts split and turned into the walls at the lower end.

The Roofs of the Skylights

The roofs of the skylights are boarded with dry 2 in. spruce plank, grooved and tongued. The other roofs and the vertical ends of the skylights are boarded with matched spruce boards, and all floors are boarded at 45 deg. with spruce, hemlock or North Carolina roofers.

Cornices and other exterior wood finish are of Gulf cypress; likewise outside doors and door frames.

Windows are of double-thick French or German glass, or equal, and the front door has a transom of leaded glass.

The Blackboards

Each of the classrooms is provided with blackboards of Pennsylvania slate, those on the side walls being stationary and those at the back of the rooms being attached to the doors of the Chicago wardrobes and counterweighted so as to slide up and down.

The boys' and girls' toilet rooms are equipped with sanitary metal toilet partitions, or equivalent, and are finished with a 7 ft. dado and tile floors with sanitary base.

The floors of all the rooms are of 2¼ in. clear maple flooring, 10-lb. asbestos asphalt paper being placed between finished and lining floors.

The Covering of the Flat Roofs

The entire flat roofs are covered with 5-ply. Barrett specification tar and slag roofing, consisting of one thickness of 5-lb. felt or sheathing paper, two plies of specification tarred felt, a coat of pitch, three plies of specification tarred felt, mopped with pitch, and a coating of pitch into which is embedded at least 400 lb. of gravel per 100 sq. ft.

The specifications require that the roofing shall be done by a contractor approved by the Barrett company and be secured by a 20-year surety bond guarantee, as offered by that company.

All the visible roofs are covered with Spanish roll tile, over 40-lb. asphalt paper. The copper flashing for the tile roof are of 16-oz. cold-rolled copper. The sum of $1,400 is allowed for the tile roofing, and $450 for flashing in connection with it.

The architect is W. H. McLean, 110 Tremont Street, Boston, and the general contractors are Perkins & Wells Co., Inc., Concord, Mass. The consulting architects are Coolidge & Carlson, 89 State Street, Boston.

A five-room schoolhouse of the one-story type, also designed by Mr. McLean, was recently erected at Groton, Mass., and a three-story building of stucco construction was built by the town of Whately, Mass., at a cost of $9,000.

A Comparison of Construction Costs

A comparison of construction costs of two and three-story buildings of the same character of materials makes it evident that cost of building is not materially different for equal capacities. It is claimed that the cost of building the one-story type is less than for equivalent capacities in several stories, owing to less steel work required, lighter wall construction and other considerations.

Inquiry of the school committees of the several towns in which schoolhouses of the type have been built, reveals the fact that they are generally satisfactory. The only objections expressed are: A tendency to excessive heat in warm weather; difficulty of keeping the roof from leaking, in one instance; and one objection that the system of overhead lighting "casts shadows." These are disadvantages, however, which can probably be obviated or overcome.

The Heating System Used

The artificial heating of this type of schoolhouse is provided from apparatus located in a small basement, the pipes running through trenches to the various rooms. The steam gravity and the Plenum systems are both employed. The chairman of the school committee of Barnstable, Mass., says: "The one-story schoolhouse costs no more to heat than one of two stories." In the Windsor, Vt., building it was possible to heat with one boiler instead of the two provided.

Ventilation is provided for by means of shafts. It was found in one instance that cold air settling at night caused trouble, hence dampers were put in the flues and these closed at night.

It is stated that during the last ten years the average annual American fire loss was $230,000,000. This is equivalent to the destruction of a $4500 residence every ten minutes. The average per capital fire loss in six European countries is about 33c. in comparison with the per capital loss of $3 in the United States and Canada.

How the Builder Can Get New Business

Sales Methods Which Can Be Followed to Combat the Slump in the Building Industry

By Bricksand Mottar

"I DON'T agree with you at all, Mr. Jones. The condition of any man's business depends at all times upon his ability to produce new business. If times are good, he may do well because of some one else's activity, but when times are hard, he must depend upon himself. I'll grant you that the building industry is far from being as active as we might wish for, but I won't admit that you can't pick up some kind of work that will more than pay your running expenses."

Jameson was a wide-awake traveling salesman who had had extensive experience with successful builders. He liked Jones, and hated to see him giving up the ghost because of unfavorable conditions.

"Now you lookee here, young man. I've been in this here town for twenty-five years, and I reckon I know just about how much business a man can get out of it. I tell you that people haven't got the money to spend; besides materials and labor are way up."

"You are only half right. Building costs have gone up, but the rise has not been high when compared with other things that people are spending money for, and these things are being sold because the sellers have gone to it with a right good will. They've found means to meet the unusual conditions which are prevailing, and that's what you're not even trying to do. You act like a poor simp who hasn't as much gumption as a cockroach. Even a cockroach won't starve in an empty house when he can go next door and get his fill."

"Now you lookee here, young man——"

"Lookee here, yourself. You say that there's no business to be gotten. I say there is, and I'll show you how to get it. Do you know anything about









TOP PICTURE — Garage with chauffeur's quarters in second story

PICTURE AT THE LEFT —A design that harmonizes with an English half timber residence

PICTURE ABOVE — A one-car garage with roof covered with green asphalt shingles

PICTURE AT THE LEFT —Garage connected with residence by covered passageway

building garages for keeping private cars?"

"Just what do you mean, Jameson?"

Jones thought it was easier to let the young chap talk his head off than to argue with him.

"Things that would enable a car owner to have some accommodations for going over the machine. Take Daly, for instance. He's a sheet metal man who's captured a lot of the private garage building



A Two-Car Garage with Pergola Effect Secured by the Projecting Rafter Ends and the Trellis at the Sides

business around here. He advertises, 'Want to save high garage bills? Come down to Daly's shop and he'll show you an all-metal garage which he will duplicate for you at a cost of $——.' He gives nothing but a box to put a car in, absolutely no conveniences of any kind. His service is darned expensive, but the people don't know it."

"I don't see how that's a-going to help me any."

"I'm merely showing you that Daly is doing business which you can get. And now I'll show you how to get it. Come on down with me and we'll see who's taken out automobile licenses lately."

On the way down Jameson explained his idea. "The man who has just bought a car and who has no barn, generally keeps his auto in a public garage until the bills begin to come in, and the average man can't afford to shell out his hard-earned cash for the rents, services and tips that he's held up for. Any chap who comes along and shows him how he can save this money by an expenditure less than his yearly garage rent is a little tin god to him. Now, I'm going to find out the people who have taken out auto licenses recently. They are prospects. We'll find out just which of them are using public garages, and will sell them a comfortable, convenient garage, which you'll build for them. Get me?"

"Yep."

"You can get a list of all the car owners in the state up to date if you want to buy them at a penny a name, I think. The Secretary of State in each state can either furnish you with a list or refer you to where you can get one. But this way is cheaper."

A list of licenses was easily secured, and then the two started out to sell a prospect. The first one looked good to Jameson.

"Is Mr. Hobson at home?" the salesman asked.

"Yes, sir. Who shall I say wants to see him?"

"We wish to see him about his car which he is keeping at the garage near here." Jameson had seen that the car was not housed on the premises, and then inferred that it was kept in a public garage, convenience, of course, dictating a nearby one.

"Good-morning, Mr. Hobson. My name is Jameson. I understand that you have recently purchased a car which you are keeping at the public garage near here?"

"Right you are, Mr. Jameson."

"My experience with public garages is that they're a rather expensive proposition. How do you find them?"

"If the man who sold me the car had told me how much it was going to cost to keep it, I reckon I'd have hesitated more than I did about buying."

"Oh, a car's a mighty big convenience and gives a lot of pleasure to the folks. But I should think that you'd rather have it on your own property."

"I was thinking of going down to see what those sheet metal garages are like."

"They're good enough. But you've got a nice house here and a little garage built to conform with the architecture of it would look a lot nicer than a sheet metal one which has duplicates all over town. Don't you think so?"

"I guess you're right about that."

"And, besides, a lot of conveniences can be incorporated which would be impossible in the sheet metal one. I noticed a man down the street with one. He had a large car and had to haul it outside in order to have room to repair it. Now, supposing it started to rain while he was fixing things up."

Hobson laughed, and Jameson continued.

"A small garage should have the floor slope toward a drain so that when the car is washed the



Colonial Type of Garage with Quarters for Chauffeur at the Side

water will flow away. A work bench, clothes closet, protected electric light on a flexible cord for lighting dark places under the car, provision for ventilation and carrying the exhaust gases of the engine outside by means of a rubber tube which can be slipped over the exhaust pipe, heating, a small wash basin, and a lot of those things would help, wouldn't they?"

"Decidedly!" Hobson was genuinely interested in the idea of a pretty garage conforming in design

to his house and fitted up with the conveniences which his imagination could see were absolutely necessary for his comfort. "Do you know anybody who can do a good job?"

"Certainly. Pardon me for not having introduced Mr. Jones, the builder. He's done a lot of this kind of work. I knew that you had a car and couldn't help feeling how convenient a little garage with an individuality would prove to you. So I trust that you'll pardon me for coming in."

"Of course, of course, Mr. Jameson, and I'm pleased to meet you, Mr. Jones. I'm new as a car owner, and appreciate a little kindly help. Can you work out the details of the garage for me now?"

After they left Mr. Hobson, Jameson said "Well, Mr. Jones, I think I've proved my point. Not all of our prospects will be as easy as this one, but, handled right, they should fall your way, if anybody's. You can make new business by building garages or remodeling old ones. Lots of car owners would welcome a few hints as to how they can increase their comfort by a few of the conveniences which captured Mr. Hobson's fancy."

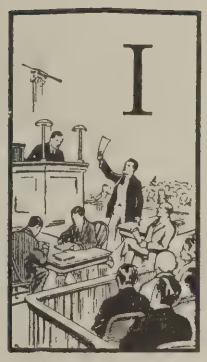
"I guess you're right, young man. You can take it from me that that's an idea which I'm glad to be next to, and I'm going the limit on garages."

"One more thing, Mr. Jones. Every job you do should have a sign on it, 'For a garage as pretty as this one, come to Jones, the Garage Builder.' That will prove a good ad for you. To-morrow I'll show you some more new business."

The Builder and Fire Regulations

How Architects and Contractors Are Legally Affected by Fire District Ordinances

By A. L. H. Street.



IN briefly considering some of the legal aspects of municipal ordinances which prescribe territorial limits within which buildings of inflammable material shall not be constructed, we pass over the architect or builder's interest in the regulations as property owner, treating only his relation to the property of others in his professional capacity. It has come to be well-settled law that it is within the legitimate powers of the governing body of a municipal corporation to promote the public safety by fixing reasonable fire limits and by inhibiting erection of further wooden buildings within such limits. The chief difficulties which the courts now confront under these regulations is in determining how far an existing wooden building may be altered without amounting to prohibited new construction or reconstruction.

When a Building Contract Is Invalid

Although the owner is, primarily, the only person held responsible for violations of these building regulations, an architect or builder must take cognizance of the ordinances when undertaking to do work for owners affected by them. His failure to do so, will, at least, jeopardize the validity of his contract, and possibly affect his right to collect compensation agreed to be paid for his services. The appellate courts of New York and other jurisdictions have decided that a building contract is invalid if it involves a violation of building regulations. So, the Connecticut Supreme Court of Errors declared that where, under a statute requiring plans and specifications in certain cases to be officially approved, a contract was entered into with a view to disregarding this requirement, the agreement was not enforceable; and the California Supreme Court has held that a contract is invalid if it contemplates a building improvement without procuring a permit required by law.

When Regulations Are Violated

Although there is an increasing tendency of city authorities to place a ban against "iron-clad" buildings, especially where the interior construction is of wood, the Supreme Court of Colorado has decided that a building covered with corrugated iron is not a "frame building," within the meaning of an ordinance forbidding the erection of frame buildings within prescribed fire limits (Olmstead v. People, 91 Pacific Reporter, 113).

On the other hand, the North Carolina Supreme Court holds that placing a metal roof on an existing wooden building constitutes a violation of an ordinance prohibiting repair or improvement of buildings not constructed of brick, stone or cement, although the building is thereby made safer than before (State v. Lawing, 80 Southeastern Reporter, 69). The recognized object of this ordinance is to prohibit indefinite continuance of objectionable buildings.

Building to Be Covered With Fire-Proof Roofing

The Georgia Supreme Court has adjudged that an ordinance, providing that all buildings to be constructed within described fire limits shall be built

of incombustible material and covered with fireproof roofing, is not complied with by erecting a wooden frame and covering it on the outside with corrugated iron, the interior, including the flooring and ceiling, being entirely of wood (City of Sylvania v. Hilton, 51 Southeastern Reporter, 744).

According to the Supreme Court of South Carolina, a municipal requirement that roof repairs be made of non-inflammable material applies only to such repairs as materially affect the fire risk; substitution of a few new shingles for old ones to stop leaks in a roof does not infringe the regulation. (Town of Seneca v. Cochran, 66 Southeastern Reporter, 288.)

Amount of Repairs Not Limited

Since it is well established by court decisions that existing wooden buildings are not affected by a new fire regulation of the kind here discussed, and that, as a general rule, "repairs," as that term is generally understood may be afterwards made, the Indiana Supreme Court declared in the case of First National Bank v. Sarels, 28 Northeastern Reporter, 434, that an ordinance may not validly limit the amount of repairs that may be made, so long as there is not a substantial rebuilding of a structure. In this case, an ordinance purported to limit to $300 the value of repairs that might be made.

When a Building Cannot Be Moved From One Place to Another

That an ordinance permits repair of buildings within fire limits does not imply permission to remove a building from one place to another within such limits, especially where the ordinance forbids "erection or placing" of wooden buildings within those bounds, holds the New York Supreme Court (Griffin v. City of Gloversville, 73 New York Supplement, 684). A similar decision has been announced by the Utah Supreme Court, and for stronger reasons the highest court of Minnesota has held that the removal of a wooden building into a fire district amounts to its erection therein in violation of an ordinance.

The building of a kitchen on the rear of an old dwelling-house was declared by a New Jersey court to constitute a violation.

In a comparatively recent decision, the North Dakota Supreme Court decided that an ordinance forbidding construction of wooden buildings within fire limits is not violated by repairing or remodeling a wooden building, unless the work is carried to the extent of substantially erecting a new building (City of Mayville v. Rosing, 123 Northwestern Reporter, 393.)

When Alterations Are Permissible

An ordinance of the city of Bradford, Pa., forbade "construction" or "reconstruction" of buildings in the city's fire district except where incombustible materials were used, and in the case of Contas v. City of Bradford, 55 Atlantic Reporter, 989, the Pennsylvania Supreme Court ruled that the regulation did not preclude a change in a wooden building by installing a new front of galvanized iron, ceiling of steel, and roof of slate, although the height of the building was increased 6 ft., 2 in., it appearing that there was no substantial change in the building such as could be justly termed "reconstruction."

Stamford v. Studwell, 21 Atlantic Reporter, 101, passed upon by the Connecticut Supreme Court of Errors, was a similar case. There, the building was a two-story one, with attic, and a fire destroyed the roof, injured the attic and did considerable other damage, but the court held that restoration of the building must be regarded as "repair" and not the creation of a new building within the meaning of the Stamford fire regulations.

Apartment House Like an Old English Home

Among the notable building improvements which are in progress on the upper west side in New York City is the structure at the corner of Central Park West and Ninety-seventh Street, which is of the old English type and only six stories high, while most apartments erected in sections of the character of the Central Park West site are twelve stories high. The builder, Fred F. French, has ideas of his own and one of them is that a house of six tiers would be just as agreeable and financially as successful as a taller structure.

The façade is to be of brown brick broken by sections of a lighter shade panelled and stripped as in the Elizabethan style of architecture. These sections are decidedly interesting with their gable roofs and dormers affecting the homelike warmth and quaintness of the old English home.

The arrangement of the building is such as would give the impression of five separate houses, this impression being increased by the fact that each unit is architecturally just a little different from the other. At the street level of each of the openings or courts between the units are garden walls with an old fashion arch door topped by a quaint lamp. On the top of these walls are to be flower boxes suggesting to the person on the street side of the wall the beauty of the area within the enclosure.

The apartment is designed particularly for families desiring small suites or for single men or women whose incomes are sufficient to pay from $700 to $1,800 a year for an apartment which may range in size from three to seven rooms. The suites will have unusual natural light as the building fronts on Central Park on one side, on Ninety-seventh Street on the other and on the south it looks out over the edifice of the adjoining church.

It is stated that one of the leading building concerns in a Southern city reports that over 90 per cent of its work is now being done on the percentage basis.

A Wall Board-Blackboard

Some Useful Information and Suggestions Concerning Its Application Which the Practical Carpenter and Builder Will Appreciate

By Joseph A. Poesl

EVERYWHERE carpenters and builders are evincing great interest in wall board-blackboard, which is being used extensively for many different purposes. They find in it a source of profit from its application. It is used in the home and in commercial and social buildings. But naturally it is in greatest demand for the schoolroom. Wherever a blackboard, bulletin-board or scoreboard is wanted it will answer nicely. It is mighty handy in Sunday schools, kindergartens, playgrounds, nurseries, lunchrooms, conference rooms, lecture halls and stockbrokers' offices.

It was only several years back when wall board-blackboard entered the field of composition blackboard. The quick success it enjoyed is not to be wondered at because it is built up from a reliable tested base—wall board, as may be inferred from its name. All that was done with the base was to give it a good writing surface on one side and a waterproofing coating on the other. The result was a composition blackboard that had inherited the many desirable qualities of wall board. It would not chip, crack or disintegrate, and was permanent.



A Schoolroom in Which Wall Board-Blackboard Is Used with Good Effect, Also Wall Board Itself

To be sure, the writing surface is important, and was the biggest problem to be overcome. But scientific research as well as practical experience solved it in time. It was due to this that wall board-blackboard possesses a surface for writing upon that is unexcelled, not even by that of natural slate. It does away with the eye strain due to looking at some composition blackboards which reflect light and fill rapidly with chalk dust. Screeching and scratching are obviated where it is used.

Gray-black is the color of wall board-blackboard. And it never loses this color. The surface has the peculiar qualities of being too smooth to absorb chalk dust and, at the same time, being just abrasive enough to produce solid sharp lines from either chalk or crayon. It does not become slippery or shiny, and deadens sound, making it noiseless to write upon. One sweep of the eraser cleans it thoroughly.

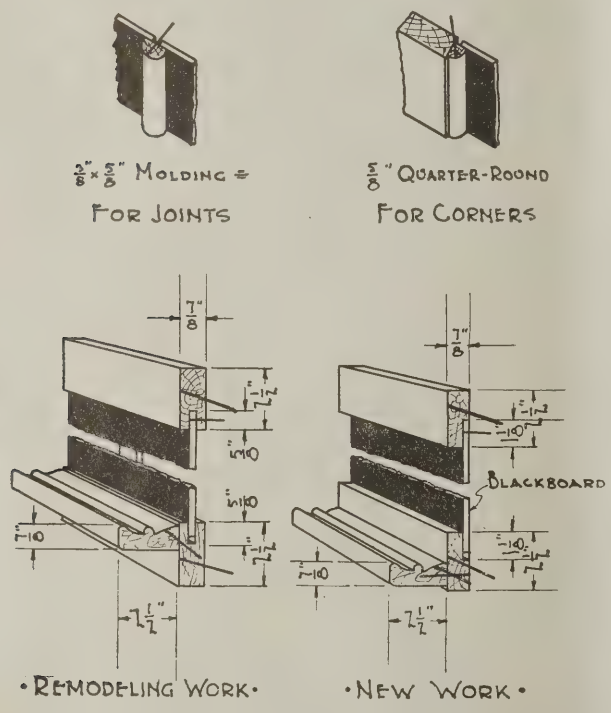
One might be led to believe that the coating of slating, which is the writing surface of wall board-blackboard, would last but a short time. Laboratory tests have proved that it will last at least ten years of actual usage. Many brands of this blackboard are guaranteed for that length of time. If at the end of this period the slating has become worn through (which is very unlikely, however), it need only be given a coat of the special slating liquid, procurable from the various makers, to make it as good as ever. The expense is comparatively small. Wall board-blackboard comes in lengths up to 16 ft., and a 16-ft. slab is nearly always sufficient to take in the entire side of a schoolroom.

But the greatest advantage is in the fact that wall board-blackboard is obtainable with a pleasing green colored writing surface. It is a well-known assertion of medical men and oculists that this color is easier on the eyes than black. In addition, psychologists say color plays an important part in influencing our conduct; then, certainly green, a color most everywhere apparent during the day, should have a better effect upon us than black, that somber color of night when humanity sleeps. Green blackboard also lends itself better to the decorative treatment of a room.

Any Carpenter Can Do the Work

Any carpenter can apply wall board-blackboard. The procedure is simple, as will be seen from the instructions that are furnished with every lot sold. The remarks on the application that follow, it is hoped, will assist those interested in turning out satisfactory work every time.

No special preparation of the walls, other than that for wall board, is required for wall board-



blackboard. However, if the studs are spaced at a greater distance from center to center than 16 in., additional studs should be inserted to make them so or less.

Care should be taken to select the proper sizes of slabs, and to locate them in accordance with modern standards of schoolroom construction. The narrowest width is best suited to the primary grades; the next width to the fourth, fifth and sixth grades; while the widest slab is for the rest. These widths are, namely, 36 in., 42 in. and 48 in. From the floor to the top of the chalk rail the distance is varied for the different grades as follows: up to the fourth, 25 in.; fifth, 26½ in.; sixth, 28 in., and the others, 30 in.

When a wall is more than 16 ft. in length, and it is desired to have the blackboard run the entire length, the joint between the slabs should be placed exactly in the middle. To cover this joint a special molding is used, which is shown in the drawing reproduced herewith. Where the slab meets a door or window frame the other molding shown is employed. Frequently, however, it is made unnecessary by extending the regular rabbet or grooved molding entirely around the slab.

Wall Board-Blackboard Must Be Nailed on Top Edge Only

Wall board-blackboard must never be nailed on any other edge but the top one. Here a nail should be driven through it into every stud, which leaves the slab suspended. Now the top molding is fitted tightly against the nailed edge of the board, as depicted in the drawing. The remainder of the molding for the sides and bottom must be applied in such a manner to leave a ¼-in. space for expansion between the edge of the board and itself. Insomuch as the slab is hung from the top it will always lie flat, because in expanding its own weight draws it down. If, however, the expansion space were provided at the top instead of at the bottom, the weight would have a tendency to force it outward. It must be borne in mind that no other nails than those already spoken of should be used. As is the practice in wall board application, it is well to stain the molding before putting it on.

The Kind of Molding to Use in Remodeling Work

With regard to remodeling work, if the surface against which the blackboard is to be placed is at all uneven the grooved molding with the leveling laths, also shown in the drawing, is the proper molding to use. The leveling laths are located in the same way as studs. The rest of the application is similar to that for new work, which has been outlined.

Shreveport Builders and Material Men Elect Officers

The members of the Builders and Material Men's Exchange held a very enthusiastic meeting on the afternoon of Saturday, Oct. 6, when officers for the ensuing year were chosen as follows:

President.....Abry Cahn
Vice-President.....J. J. Hamiter
Secretary-Treasurer.....Alex. Benoit

The exchange is greatly interested in war relief work and it was decided to install a Red Cross box at headquarters for the convenience of raising additional funds for this purpose.

A decision has just been rendered by Supreme Court Justice Gavegan to the effect that owners of industrial buildings in New York City must comply with the orders of the State Industrial Commission prescribing alterations that will lessen the fire risk even if the structure is considered fireproof and complies with the requirements of the Board of Fire Underwriters.

How Construction Work Is Scheduled

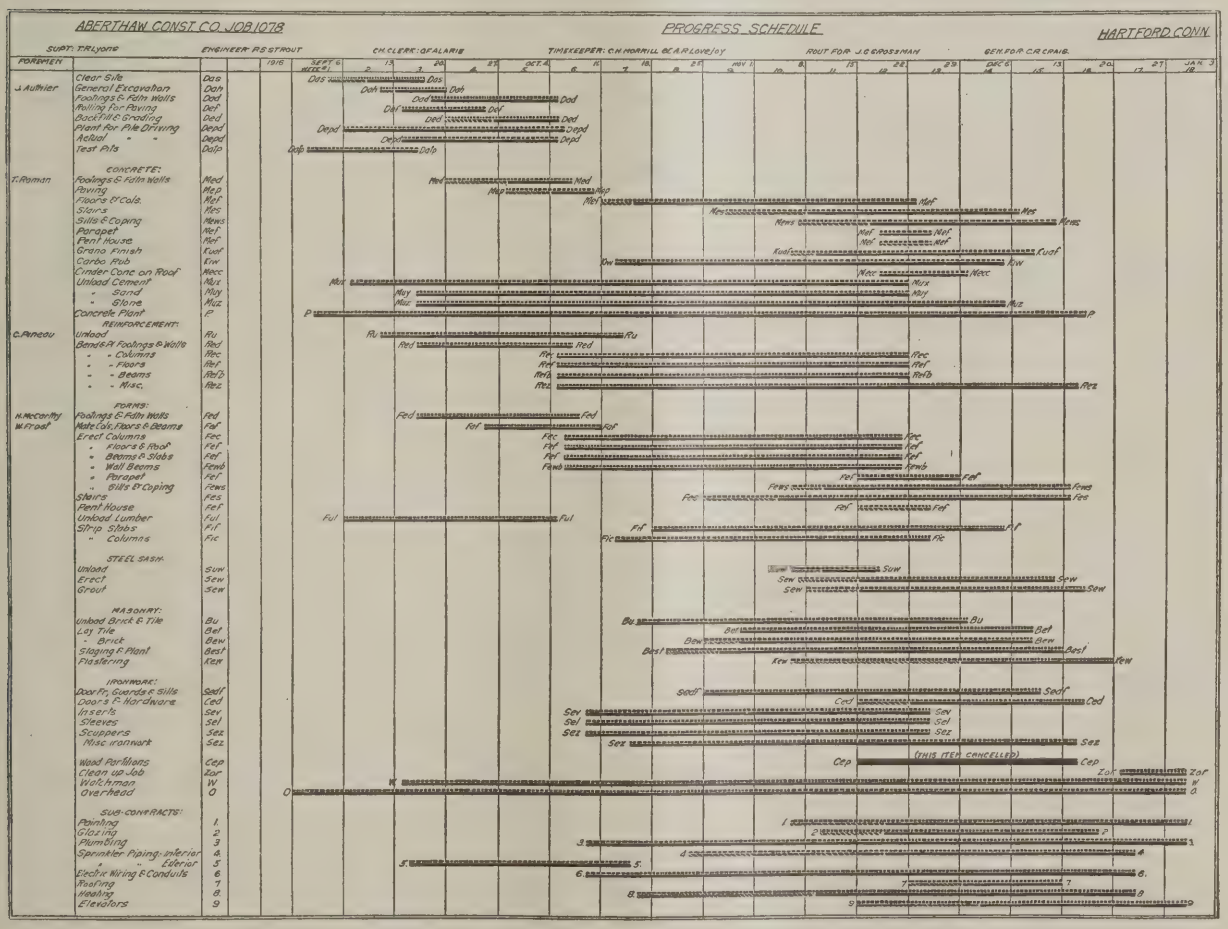
A Comprehensive Method of Keeping Track of the Progress of Work on a Building Job

By Fred R. Lufkin

A PLAN has long been sought whereby the number of men needed at each step in construction work and the time of delivery of each item of material for the job can be definitely known before work is started. A rather interesting scheme to this end has recently been carried out by a prominent Eastern construction company,* details of which are given herewith.

As soon as the job was awarded the company made a probable square foot of floor cost and began clearing the site. Meanwhile, bids were secured on footings and pile foundations. Coincidentally, after a quick and thorough survey of local conditions, such as the available vacant land, the railroad siding and the probable streets along which materials could be delivered and nearby sources of material that would be required, the engineering department made its first plant layout. Bins, sheds and office buildings were located and the place allotted for every class of material arriving on the job.

At the next weekly conference of the contractor's staff the entire job was taken up for discussion and definitely organized. At this conference were present the man who secured the contract, the general superintendent, the chief engineer, the purchasing agent and the schedule engineer. A building superintendent was selected, also his principal assistants, the carpenter, labor and planning foreman, engineer and the master mechanic.



Progress Chart Which Graphically Represents the Dates and Limits

*Aberthaw Construction Company, Boston, Mass.

The discussion covered plant layout, including number and location of mixers, method of distributing the concrete, purchase and handling of lumber for forms, requirements in the way of steel and cement, prices and deliveries of these materials, architect's drawings, tentative progress schedule and many minor questions. When each man left the conference he had a definite idea of the part he was to play in the new work.

Perfecting the Progress Schedule

As a basis for all operations the schedule engineer immediately perfected his progress schedule. Between the reports of the schedule engineer and the chief engineer the architects were constantly kept informed as to the dates upon which drawings must be in hand, while the requirements in the way of form lumber, steel, cement, etc., were furnished to the purchasing agent. The latter's responsibility ended when he had placed an order subject to specific deliveries. The job superintendent, being informed of the conditions of these orders, thereafter assumed responsibility for the direct following up of the required materials. All cases that he could not handle were referred back to the traffic department of the main office. In the case of subcontractors who were manufacturers, schedules were furnished and close touch was kept with the dates of beginning work and shipping finished products ordered.

The Situation Complicated

On this particular job the situation was complicated by the New England freight embargo, but by having some source of supply always held in reserve serious delays were avoided. Plant equipment, small tools and stationery were requisitioned by the building superintendent upon a very complete blank furnished for that purpose. This blank covers everything required in the way of "plant" from band saws to vertical engines, of small tools from anvils to wrenches, and of stationery from pay envelopes to rubber stamps. It is the business of the "yard" to keep its stock complete in each of the items so that shipment may be made without delay.

Following the requirements of the plant layout, offices and storehouses were shipped from the contractor's yard, each building being made of standard sections 15 ft. wide in 10-ft. lengths.

Cement and Lumber

As soon as the cement schedule was made out the order was placed, the storehouse was filled in advance of requirements, continuous shipments from the cement mill were maintained and arrangements made with a local dealer so that his supply could be drawn upon in case of emergency.

All scheduled "form" lumber cut to dimensions was turned out by a local mill, delivered by truck to the job and piled separately, according to size, and ready to use.

The progress chart which graphically represents the dates and limits, and serves as a basis for recording progress, is reproduced herewith. Three blueprints of it are sent to the job, one for the superintendent, one for the routing clerk and a third to be brought up to date weekly and sent to the Boston office. Another copy is kept on the board in the Boston office and is brought up to date weekly from the copy sent in by the job.

On the blank blueprint each item of work is represented by a wide, white line. When the work is started it is recorded on the sheet by drawing a yellow line over the upper part of the heavy horizontal line. The length of the yellow line is made proportional to the amount of work done on that item, the entire heavy line representing volume rather than time, although it spans the period between the scheduled beginning and ending. It is, therefore, evident that the ratio of the length of yellow line to the total length of the heavy line represents the proportion of that particular item of work which has been completed.

The Red Line

When the work does not start on time a red line is drawn over the lower half of the wide line and is continued to the date when the work stops. Then the yellow line is begun in its proper place. The red line therefore shows at a glance just how far behind the work is upon a given item.

Each week a piece of string is stretched vertically across the chart from the current date shown at the top of the sheet. If at any time the yellow lines extend beyond the string it indicates that the job is ahead of schedule on that particular item. Thus, the progress of the entire job is visually shown from day to day on the bulletin board in the home office.

An English Idea of American Homes

Before I came to America I fancied that I should find one long row of apartment houses extending from New York to San Francisco, some of them palatial, but tawdry, others lowly and some squalid, says Lady Inez Stuart in *Countryside*. This idea was partially formed from reading in your own journals of your lack of home life as compared with our preponderance of it in England. On the contrary, I found in the localities I visited much that we can learn from you Americans of homemaking and of home living. The amazing thing to me is what your women accomplish in the actual building of their homes, and that, too, with small means.

In order that students at the State College of Forestry at Syracuse University may learn of the characteristics of various woods by actually working with them, a shop is being equipped in the new building on Syracuse University Campus. Most of the important types of woodworking machines will be installed in this shop and students will also have a chance to learn something of the art of finishing woods. To those of the graduates who eventually enter the lumber business, intimate knowledge of their product will equip them for a new and expert kind of salesmanship.

"Kinks" From a Carpenter's Diary

Short Account of Various Happenings in the Every-Day Work of the Carpenter

By Hammer and Saw

AT the supply store office where the (old man) carpenter-foreman had sent me after some cupboard fixtures for the dwelling house we were then finishing, the supply dealer and a salesman were having an argument on the merits of hard pine versus hemlock for rough framing material. I did not take much interest in their discussion, for my mind was on a job I left half finished—cutting picture molding, using a new miter box, the purchase price of which nearly busted me—and I wanted to hurry back and complete the work; in fact, I do not like these errands at all, but the old man always sends me because, I suppose, I'm the cub of the gang.

I have been chided by other members before now in that I had a "pull." You see they looked on me with envy because I had these errands to do, for they give a fellow a chance to loiter along the way, kill time, etc. However, there is too much of that kind of "soldiering" on jobs all the time, and I am willing that any one should have my "pull," also the job of fitting in of Dutchman strips between ends of clapboards and corner casings, and patching in little pieces of lath between studs in connection with remodeling work.

Some valuable suggestions for the practical carpenter and builder are presented in this article. When the enterprising carpenter starts out as a contractor he should be satisfied with nothing but first-class work. He should study the needs of the community and make his work in harmony with them.

For the jobbing carpenter there is always something to do if he will only look around and find it. If he does his work well he will always be in demand and will establish a reputation for his labor that will soon bring him into a position to take contracts for much larger operations.

The practical mechanic is always interested in "short cuts," improved methods of doing work and "kinks" which will help him to accomplish in shorter time that which would perhaps entail delay if conventional practices were followed.

When I arrived back on the job, the men were arguing over the holding power of a nail when driven slanting upward or straight in. Truly this was the morning for argument.

The old man motioned to me and we went to the rear and started digging holes for short pieces of pipe to support the sills of a porch—another "pull" job. However, I am determined to get back at them when I start contracting on my own hook. Speaking of the present methods of contracting just from an observation point of view, I believe you will all agree with me in saying the motto should be "High grade work."

When the time comes in a carpenter's career that he receives his first contract for a job of work—it may be a house, factory, store, or even a shed—no matter how modest, he will feel as proud as if it were the erection of a modern skyscraper. Having saved a little money, and obtaining credit from his local supply dealer, he strikes out on his own responsibility, for heretofore he had always taken orders from the boss. No matter how good a mechanic he may be, or how much available credit he may have, there are snares and pitfalls that will wreck the best of them every day.

Lots of valuable information can be gained from the experience of others, be they success or failure, for no man, no matter how good he may be, but will find that there is always some one a little bit better. A definite goal should be the objective for which he should strive; a serious study of every element entering into the business, with ever the thought before him of *better work*—the Lord knows there is enough of us doing the other kind. And when the job is entirely completed the contractor's interest should not rest there; he should go further. The owner may have other work in the future. Jump around once in a while and try to make the owner feel you have an interest in him, for owing to climatic changes a door may have swelled, needing a little dressing; a few adjustments may be necessary to the lock, windows, etc. A little work given free gratis at dull times will not break you and it has a tendency to make the owner feel better natured, makes him feel as if he was getting his money's worth at least, be he even a "tight-wad."

It is also a good plan to consider respectfully any suggestion the women folks make, for they, when it comes right down to business, are the Boss in most of the home building projects. And remember the contractor who gets the most work, always makes the most money. There is a class who have a mania for rushing after all the jobs in town; rushing the work when secured but they are themselves next rushed into bankruptcy.

In towns and small cities where there is no architect, the responsibility is heavy; his advice and plans are followed to a great extent by the owner,

and here the contractor has an opportunity to do cheap work and gain a little in the way of money, yet he does not prosper in the end, for he will eventually be turned down and preference given for an honest contractor—one who does good work and on whom the owner can depend.

Tools and equipment cost good money nowadays and if a fair profit cannot be made after all expenses are met consistent with good work, the contractor will be ahead of the game to work for the "rusher variety" of firms at regular weekly wages.

Some of the readers will no doubt say "Bosh!" to all this, yet have you not in your own town a certain man—a building contractor—who is never idle even in the dullest time; who does not seem to make much effort yet obtains the best class of work; who meets his bills promptly when due, never has any trouble securing help or material; his family lives well, dresses well, has a new car and goes in the best of society? You wonder how he does it. My friend, there is no secret about the matter; this man makes a practice of doing only *high grade work* and as a result he gets it.

Often the occasion arises when the jobbing carpenter has to make the window and door frames on the job. I have seen frames made at the planing mill that were certainly very flimsy affairs, especially in the rush season. The little crimped metals called dovetails are handy; about as cheap and better than nails in drawing tight together the joints between head and side casing which are always open unless fitted carefully. Have a box of these metals handy and drive a couple in this joint at the underside of the outside casing. These joints and frame should be primed with putty but it is not always done.

Finishing lumber for cornices should be jointed but some carpenters neglect to do so.

Erecting staging is more important than the amount of attention it usually receives. The work should not be left to boys or to indifferent workmen. Serious injuries are often caused in this way. Nails and sound lumber is cheaper than human lives. One foreman I recall always selected his staging material very carefully. I remember filing notches in the upper ends of cleat boards for the arm to fit into. This foreman explained "that the arm resting on this notch had a bearing, consequently would resist heavy wind or sudden jar loads." It looked good to me at the time and does yet. Butternut being tough, will hold nails better and make the best cleat boards.

Nail sets are a handy little article to have in one's apron but I seem to be unlucky in losing mine so I use a common nail; place the head on the nail to be set, and drive it with the hammer. Try it, you will find it answers the purpose of a regular set.

About the biggest nuisance on the job is the man who is continually borrowing one's tools and apparently forgetting (?) to bring them back.

I have seen several methods of anchoring sills to walls. The method shown in Fig. 1 is simple and practical. The iron plates ½ in. thick rest on top of the wall and are spaced about 3 ft. apart. The bolts used are ¾ in. There is a continual air space between the sills and concrete, thus greatly eliminating the chances of dry rot.

There are several metal clapboard markers used but the one shown in Fig. 2 is made out of a strip of wood 12 in. long about ½ in. thick by 1½ in. wide. A block ⅞ x 2 in. is fastened with screws at each end. A coat of shellac may be added and then it will answer the purpose of any marker.

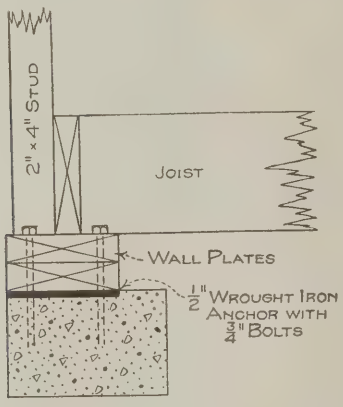


Fig. 1—Method Suggested by the Author for Anchoring Sills

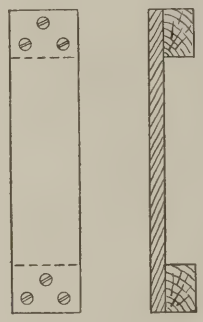


Fig. 2—A Homemade Clapboard Marker

Various "Wrinkles" Suggested by "Hammer and Saw"

Moving Picture Studio Buildings in Upper New York

The upper section of New York City will soon witness the erection of two large moving picture studio buildings, each three and a half stories in height and constructed of reinforced concrete, brick and steel. The plans have been drawn by Architect Thomas W. Lamb, who estimates the cost at about $350,000. The buildings will be located at 193d Street and Amsterdam Avenue, New York City and the general contract has been awarded to the Fleischmann Construction Company.

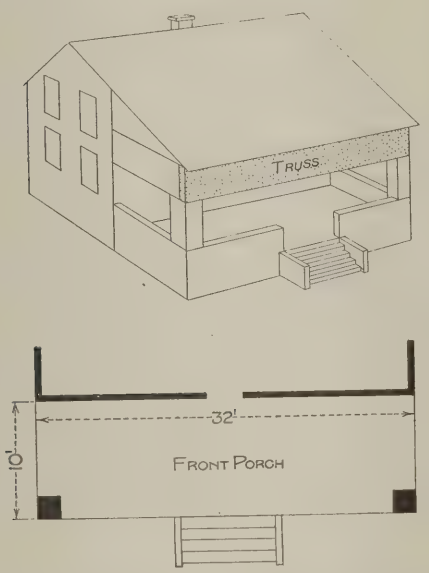
Eighty-nine communities in England and Wales are considering town planning schemes on a large scale.

CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

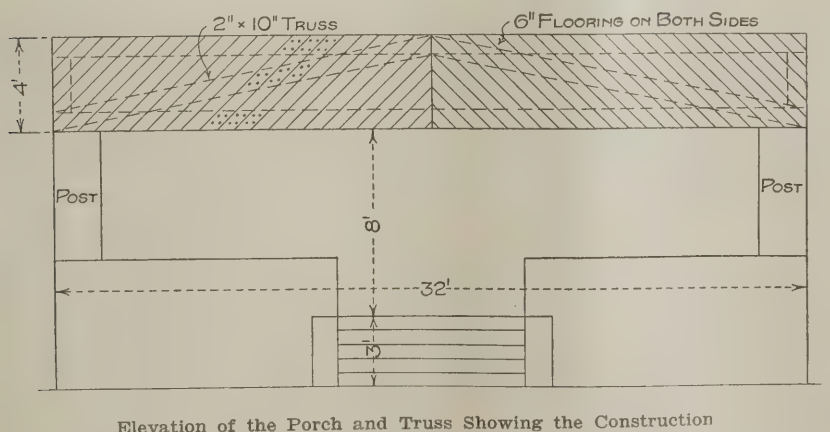
Truss Over Bungalow Porch

From W. E. F., Charles City, Ia.—We are building what may be designated as a semi-bungalow 32 ft. wide and the roof of the building runs down over the front porch. We did not care to obstruct the view from the north by having any more porch columns than were absolutely necessary and as a consequence we have erected two heavy posts—one at each corner of the porch as shown on the sketches sent herewith.

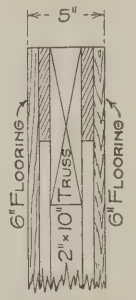


Plan of Porch with Perspective of House Showing Location of the Truss

In order to carry the weight of the roof without sagging, we built a simple truss, the details of which are shown in one of the sketches. It has worked out very satisfactorily to all concerned and the nature of it is such as to render it very easy to erect. It is 4 ft. high and as wide as the house. The drawing shows very clearly how to construct it so that the ordinary carpenter would have no trouble in carrying out the work. The 2 x 10 in. plank truss is sheathed up on both sides with match flooring boards as a stiffener. A detail of this is also presented among the sketches.



Elevation of the Porch and Truss Showing the Construction



Vertical Cross Section of the Truss

Details Showing Manner of Building a Truss to Support Roof of a Bungalow Porch

Remedy for Troublesome Chimney

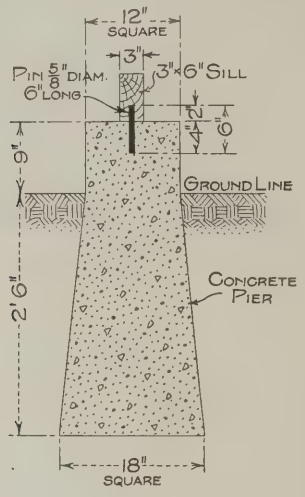
From Builder, Redford, N. Y.—In his letter in the October issue "G. C. C.," New Jersey, does not say whether he is troubled in summer or winter. In either case I do not agree with him that the trouble is due to porous brick; I believe it comes through the top of the chimney when it rains or snows. When the weather is cold enough, the cold air in the chimney and the warm air from the stove react on each other, causing water to run down the inside of the chimney. Such cases are ordinarily called "creosote chimneys."

There is just one cure for this. Pressed brick, concrete, or tile-lined chimneys absorb very little of the water formed on the inside of the chimney but allow nearly all to run down. He must run his chimneys from the basement, putting an opening in the bottom of the chimney to catch the water; the thimbles should dip toward the cen-

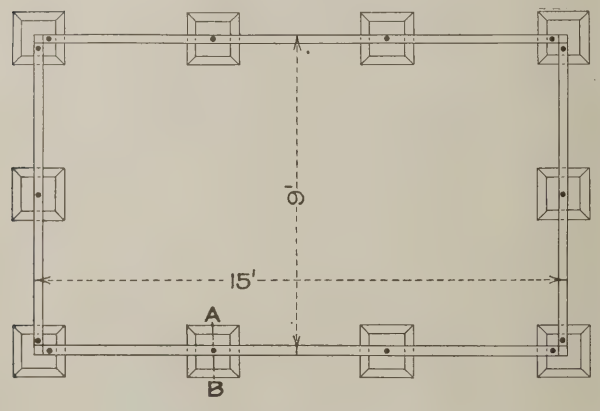
ter of the chimney so "creosote" will not run out thru them. There is no transparent waterproof paint. He might give them a coat of yellow shellac or spar varnish; but this will not stop his leaks. The larger the throat the greater will be the condensation of water.

Securing Sills to Concrete Foundations

From G. W. Childs, Engineer, Chester, Pa.—I am sending herewith for publication in the BUILDING AGE a blue print showing a method of securing sills of buildings, sheds, etc., to foun-



A Vertical Cross Section Through the Piers as A-A



Plan of Foundation Showing Piers, Sills and Position of the Steel Piers

dation piers or walls by means of steel pins of ⅝ in. diameter and 6 in. long set in the concrete. It is quite necessary that some method should be used otherwise the structure could be pushed off the concrete walls. The scheme here outlined seems to be the simplest and most inexpensive and I trust that it may be of some interest to the readers of the paper.

Brick Veneer Construction

From A. P. G., Chester, Pa.—In a late issue of of the BUILDING AGE I notice the question of "W. P.," of Minier, Ill., in regard to the construction of brick veneered buildings. In reply I beg to say that I have been using as a leader both brick and cut stone veneer facing for building, principally residences, although I have used both on a few factory buildings which the vibration of the machinery never affected. I have been using that finish since 1888 and have introduced it in several states and many cities. I have not the time to make the sketches as called for in his request, but will give him a few helpful words of explanation which will probably serve his purpose.

Avoid the extra cost of diagonal storm siding. Use instead the horizontally laid storm siding as there is no more tremble or shake in one than the other. A single board set at an angle of 45 deg. will make a brace to hold a vertical post. A building boarded closely at 45 deg. angle is no more secure against storm according to my notion than a building boarded closely on a horizontal line. Either can be blown from the foundation but otherwise they are the same as regards solidity of walls. The diagonal storm siding is best for weatherboarded buildings which prevent the nailing line coming opposite a horizontal joint in storm siding.

Make the window frames open pocket on the inside the same as for sided walls. Instead of using an outside sash stop use instead an exterior casing made from the storm siding 6 in. wide allowing the front edge to form the sash stop and set it on the outside of the storm siding. Allow 3 in. clearance in each weight pocket so as to allow for shifting the frame an inch or more to avoid finishing the brick with a small piece against the hanging stile (brick mold).

Make the door frames by using the stop casing on the outside of the storm siding. Set the edge of the casing ¼ in. back from the face of the stile and plant the hanging stile (brick mold) ¼ in. back from the front edge of the stop casing. The stop casing on the door frames can be less width than for the windows. The hanging stiles for the window frames are placed the same as for any brick frame. Allow the face of the brick work to be 6 in. out from the exterior face of the wood frame wall not including the storm siding. Avoid the use of plumb rules by bricklayers. Give particular care in having the frame of the building plumb and well board-braced temporarily. When ready for the brick work use a fine cord or wire line vertical full height of the brick work on the corners and angles which is universally used for veneer work. Avoid the cost of square jogging of stone sills for windows as they can be bevel cut on the inside corners at much less cost.

Anchor the ends of the porch sills and cut the girders to the storm siding on the frame. Do not forget to allow the 6 in. from the frame proper to face of the brick. Leave off the run of joists next to the brick until after the brick work has been completed. The porch ceiling joists should end against the frame wall and the brickwork should be built around them. Use furring blocks to face with the brick nailed to the frame to which to anchor the porch rafters and also for anchoring the

cornice frieze board. Use galvanized iron wall ties every sixth course on 16 in. centers, nailed to the storm siding and studding.

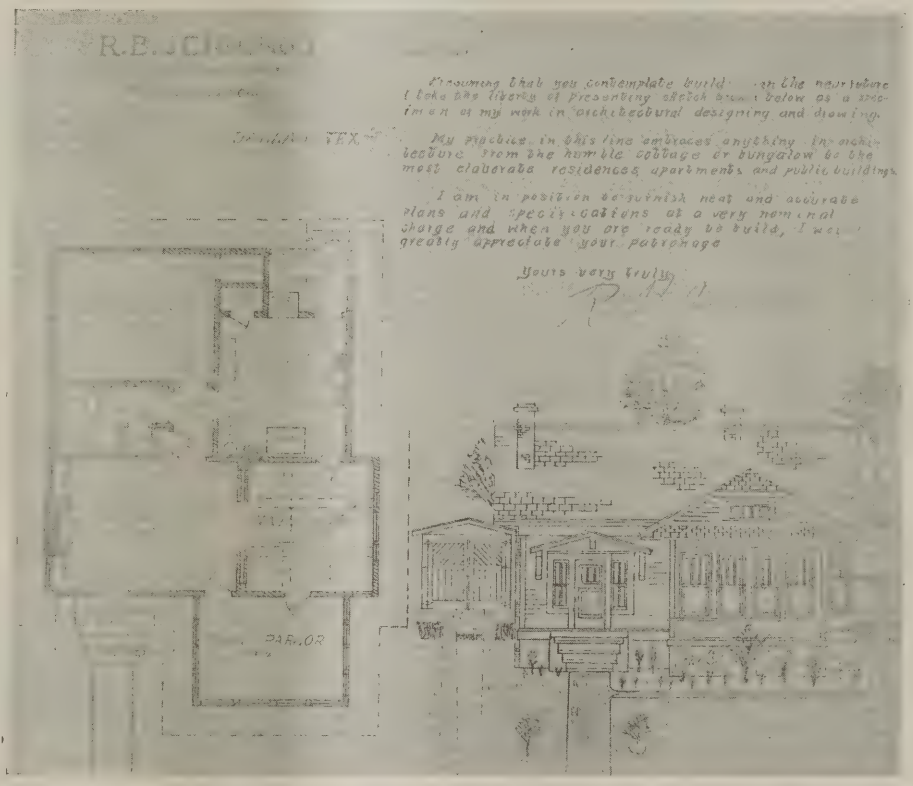
The depth of the wall from the face of the brick to the face of the insiding plastering should be 10½ in. based on using 3¾ in. width studding.

The proper measurement for the size of building is from the face of the brick work. I never use box frames for veneer work. Of course, to leave the inside pocket open will require a wider trim casing.

Difficulty of Architectural Students in Obtaining Positions

From R. B. J., Dallas, Tex.—In the September issue of the BUILDING AGE "H. D. J." of New York City makes inquiry as to the way in which he may get started and how to acquire a small compensation while learning. My solution of this problem is best explained on the attached blue print which is sent to every person who purchases a vacant lot in or near Dallas. I secure such a list from the county records. This is my own idea of advertising and the cottage shown on the blue print is my own design. I have found this to be very profitable and a good way to get started in business.

I would suggest that the correspondent making the inquiry keep in close touch with the contractors, who often need the service of a draftsman for small jobs. Real estate agents are often in touch with those who contemplate building and would probably be glad to give him the names of such prospects. I shall be very glad to give him any further information I can on the subject if he will make his wants known through the Correspondence Department of the paper.



Method of "R. B. J." for Securing Architectural Work

Note.—The letter in the upper right-hand corner of the blue print forwarded by our correspondent reads as follows, the text being here given as it is possible that some of our readers may not be able to decipher the reproduction of it:

"Presuming that you contemplate building in the near future, I take the liberty of presenting sketch shown below as a specimen of my work in architectural designing and drawing.

My practice in this line embraces anything in architecture from the humble cottage or bungalow to the most elaborate residences, apartments and public buildings.

I am in position to furnish neat and accurate plans and specifications at a very nominal charge and when you are ready to build I would greatly appreciate your patronage."

Making a Light Brown Dye

From D. P. Barry, Redford, N. Y.—It seems to me that "J. C.," Detroit, Mich., is on the wrong track. He should not look among dyes for his pigments; dyes are never discussed, so far as I have seen, among pigments. It seems to me he should give both articles a coat of the same color. The following are all the pigments of value that will give a brown shade: Raw and burnt umber, raw and burnt sienna, purple brown and Van Dyke brown are all permanent colors. Raw and burnt sienna are sometimes classed as yellow; perhaps one of them will produce his tone.

Many of the painters' browns are simply shades produced by mixture. In the case of simple pigments the shades pass by fine gradations into yellows and reds, so that the limits of classification are not well defined.

The following are generally classed as pure browns: Umber, silicate of iron and manganese; brown ochres, called Mars brown, iron brown, etc.; native and artificial earths; Van Dyke brown and Cologne or Cassel brown; peaty ochres;

purple brown and ferric oxide; Spanish brown or tiver, a brown iron ochre; bistre, washed beechwood soot; sepia; brown lake; asphaltum, natural and artificial pitch. The finest umber comes from the island of Cyprus and is known as Turkey umber.

From this list he should be able to get any tone of brown he may desire. By getting small lots of these and trying them out he must produce the color he wants, which, from his description, seems to be a tint of amber.

Unusual Title of Architect

From Builder, Washington, D. C.—I inclose herewith an actual clipping of the title on a set of blue prints for a large and handsome store building. When it was shown to me I took pains to find out the reason for the peculiar wording of it, knowing that there was no architect in this city by that name. I find as a result of my investigations that the plans were drawn by a well-known draftsman, who did not wish his name to appear, therefore the adoption of the name of an artist

·BENEVENUTO·CELLINI·ARCHITECT· ·309·POPE·BUILDING· ·WASHINGTON·D·C· ·STORE·BUILDING· ·1341·F·STREET·N·W·WASHINGTON·D·C· ·APPROVED·	·DRAWN·BY·NIGHT· ·TRACED·BY·HECK· ·CHECKED·BY·GOSH· ·DRAWING·NUMBER· 21 ·AUGUST·30·1917·

Facsimile of Architects' Title on a Blue Print

now dead for more than 400 years and the peculiar statement at the upper right-hand corner. There were twenty-two drawings in the set and the building is estimated to cost more than $50,000. You might like to reproduce this for the interest which it may have for readers of the paper.

Supporting a Porch Roof of 28 Ft. Span

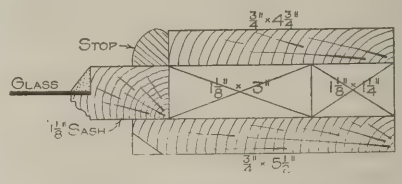
From F. W., Pittsfield, Mass.—Will some reader of the paper tell me how to support the roof of a porch having posts at the ends only and a span of 28 ft. in the clear. It is desired to make the depth of the supporting beam or truss as small as possible. The porch is 8 ft. wide and the roof is of ordinary weight and construction.

Note.—It is possible that our correspondent will be interested in what is practically a solution of the same problem presented elsewhere in this issue and contributed by a reader of the paper residing in Charles City, Ia. About the only difference in the two problems is that one has a span of 28 ft. and the other a span of 32 ft. We trust, however, that these few comments will not deter other readers from replying to the Pittsfield correspondent giving particulars covering his specific requirements.

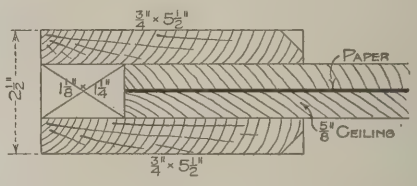
New Style Barn Doors

From W. E. F., Charles City, Ia.—We have recently completed one of the largest and most modern farm barns in Iowa, and thinking that possibly the new style doors used might be of interest to builders who want to do the work right, I am inclosing drawings showing how to construct airtight and warm doors for the stable. These doors will not warp or buckle and they always stay in shape.

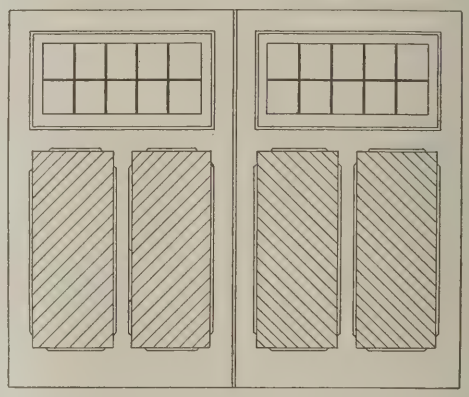
The wood panels are double thick of ceiling lumber with building paper between the layers. The



Section Through the Sash



Section Through the Panel—Scale 3 In. to the Foot



Elevation of the Barn Doors—Scale ¼ In. to the Foot

Details of New Style of Barn Doors

casings are made of common 6-in. boards and a 1⅛ x 1¾-in. fillet runs around the entire door so that the ends of the matched ceiling will not be exposed.

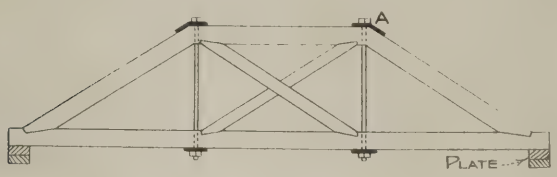
The transom sash are placed in the top and held in place by a small stop so that they can be removed at any time if necessary.

These doors can be used either on hinges or for a sliding door track. We prefer the hinged door as we can make a tighter and warmer fit with it.

Inexpensive Method of Supporting a Floor

From D. P. B., Redford, N. Y.—I have been rather attracted by the difficulty in which some of the correspondents of the paper seem to have

fallen and the character of the help given, and I have decided to try and help some of them out. I had to look a long time to see what R. W. B. Graham wanted in the July issue. He has a pretty serious job on his hands and should have given



Inexpensive Method of Supporting a Floor—Fig. 1—Elevation of the Style of Floor Truss Suggested for Use in the Attic

more details of the building he is preparing to erect. Under-trussing is not desirable and should be avoided whenever possible. Iron rods are not objectionable on this floor. He should place his trusses on the plate and build his roof on the trusses, which should be not more than 12 ft. on centers. The style of truss shown in Fig. 1 may be put in the roof and rods run from "A" to the floor beams below. The joists should rest on the top of the beams carrying the floor—8 x 8 in. of spruce, fir or pine will carry 30 tons—and 1¾ in. rods should be used. At least ten such trusses should be put in to carry the load.

In case he cannot put trusses in the attic or under the roof, he may employ the under-truss method detailed in Fig. 2. The strut must be at least 3 ft. below the top of the beam. He must use 2 x 12 in. or preferably 2 x 14 in. studs and joists 14 to 16 in. wide.

He must use a head block at each end of the joist at least 6 in. thick and as wide as the joist, which should be cambered at least 1½ in. He

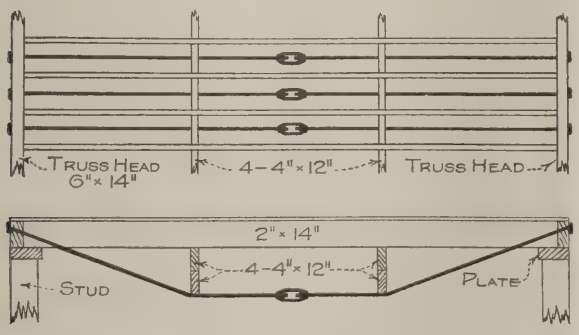


Fig. 2—Plan and Elevation of Under-Truss Method of Supporting the Floor

will require at least twenty tie-rods, each of 1 in. diameter, which should be upset at the ends to 1¼ in.

Example—What should be the diameter of each of two tie-rods required to carry a brick arch 20 ft. span from centers with a height of 30 in. at the middle to support a brick wall 12 in. thick and 30 ft. high, weighing 100 lb. per cubic foot? The load on this arch will be for whatever is over the opening. The load will equal 19 x 30 x 100 = 57,000 lb.

$$D = \sqrt{\frac{Ul}{9425d}}$$

D = diameter of rods.
U = uniform load.
l = 20.
d = 30.

$$D = \sqrt{\frac{57{,}000 \times 20}{9425 \times 30}} = \sqrt{4.0318} = 2.008.$$

The diameter of each rod is therefore required to be 2 in.

The truss head should be at right angles to the tie-rods. The joists should be loaded so they will sag half an inch, then tighten the rods. The truss rods should be about 6 ft. apart.

Workingmen's Houses in Scotland

In connection with the construction at Dundee, Scotland, of dwellings for workingmen, or, in other words, houses that can be rented at moderate rates, the Dundee Labor Housing Council has had prepared plans for dwellings covering three classes of houses all erected in blocks of two stories. The first-class contains parlor, living room, scullery and wash room on the main floor and a large bed room with two smaller ones together with bath room on the second floor. The American Consul at Dundee states that with a government grant in aid of 25 per cent of the cost and the use of old stone, the rent will be about $2.34 a week; with the same grant and new stone it will be about $2.92 a week; with a government grant of 33 1/3 per cent and old stone it will be $2.10 a week, and with the same grant and new stone $2.61 a week.

The second class is based on the two-flat system and contains living room and kitchen scullery on the main floor and two bed rooms on the second floor. The bath room is in an annex at the rear and there is also a pantry and linen closet. If the houses are built of old stone and the money grant is free of interest the rent will be about 80 cents per week and $2.12 with a grant in aid of 25 per cent and new stone used. The rent will vary between these extremes according to the conditions of the money grant and the nature of the materials used.

The third scheme combines three-room and one-room dwellings in the same block. The larger dwelling consists of living room, parlor, bed room, pantry, wash house, scullery and lavatory, and the smaller only living room with wash house, scullery and lavatory. There will be a bath room for every two dwellings.

A Minneapolis city ordinance provides that all two-story, four-flat buildings must have a side yard 5 ft. in width on each side of the building, and a rear yard at least 10 ft. in depth.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING

(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

NOVEMBER, 1917

The Shortage of Labor

The exactions which the war is making upon the Government to provide adequate supplies of every character for the comfort and efficiency of our fighters is developing such a shortage of labor as has never before been experienced throughout the United States. To offset this, it is necessary for every man who is not in the Army to render that extra service wherever he may be employed which will enable some men to drop their regular vocations and devote their time to the war work. Some men have turned down lucrative positions and are working for the Government at one-half to two-thirds of the salary they can ordinarily secure. Some manufacturers who have, with great care, selected and trained experts for their own use and who pay them large salaries have released them to work for the Government at half the salary, making up the difference to these experts from their own means. These instances are cited to show the need of every man doing his bit by taking care of all the little work that ordinarily would be left to less important employees so as to make the services of the latter class available for other work that is needed to be done. This means that the so-called leisure-class shall put their noses to the grindstone for a considerable period and give up many of the pleasant recreations in which they now indulge. It is as patriotic for a man to relinquish his leisure period and devote it to absolute labor as it is to subscribe for a bond or carry a gun. If this is done, it will have a far-reaching effect in offsetting the shortage of labor which is destined to become more acute before it is in any way satisfied.

Government Aid to Citizens

A busy man would hardly keep informed of all of the things which the different departments of the Government are issuing to aid builders, tradesmen, agriculturists, and people generally on matters having a direct bearing on their prosperity. Those best informed are quite surprised with the extent, diversity and character of the assistance which the Government is affording. They are further surprised when they are informed by those who are familiar with what is being done in some of the foreign governments to learn that as yet our Government is far behind in affording its citizens that assistance which they could turn to profitable account and to aid them in avoiding ventures that will be unprofitable or in so conducting their ventures as to avoid loss. In some quarters there is a disposition to criticize the Government for doing too much for the farmer, overlooking the fact that from the land comes the principal increase which makes the whole world prosperous. There has not been that need for assistance in other fields that there has been among the farmers who are widely separated and who cannot readily meet and discuss matters of importance where men in manufacturing, construction and mercantile lines can congregate, discuss their needs, formulate plans for relief, and lay out a course of procedure or bring them before the proper department of the Government for assistance. There is already in the documents published by the Government much more information of use to merchants and mechanics than they realize. Our suggestion is to have your home library secure the Government documents and then drop in at the Library and learn from them.

American Builders Abroad

It is a well-known fact that an enormous amount of construction work is involved in the presence of American troops in France, and in order to provide for the execution of the contract which has just

been awarded to a well-known Boston firm of building contractors special engineer organizations, headed by experts from that company, are now in France preparing for the work. Among these building experts is one who has been a voluminous contributor to the columns of BUILDING AGE during the past few years, and is well known in the engineering world. Payment for the work will be on the basis of cost plus a certain per cent, representing the profit of the contractors. Large numbers of workmen will be transported from the United States to the other side of the water, not less than 10,000, it is said, having already been listed for the purpose. In addition, all raw materials and machinery will be sent from America. The construction of the huge ordnance depot, with its multiplicity of buildings, arsenal, etc., for the forces under General Pershing, is said to involve an expenditure running high up into the millions of dollars.

The Columbus Building Show

Supplementing what appeared in our last issue regarding the Columbus real estate and building show to be held in the Ohio State Fair Buildings, in Columbus, Ohio, Jan. 21 to 30 inclusive, 1918, it may be stated that one of the features will be a conference of the main branches of the building industry in Ohio. This conference, which is the idea of Findley Torrence of Xenia, Ohio, secretary of the Ohio Retail Dealers' Association, will be developed by him with the assistance of Ralph P. Stoddard of Cleveland, newly appointed secretary of the Ohio Builders' Supply Dealers' Association.

Mr. Torrence will call a meeting of the secretaries of the following State organizations: The Union Association of Lumber, Sash and Door Salesmen, Ohio Master Plumbers' Association, Ohio Master House Painters and Decorators' Association, Ohio Face Brick Manufacturing Association, Ohio Association of Builders' Exchange, Ohio Sheet Metal Contractors' Association, and Ohio Building & Loan Association, together with the Ohio Association of Architects and others, at which time a tentative program for the conference will be decided.

The purpose of this conference is to outline different plans to acquaint the building public of Ohio that "now is the time to build," instead of waiting, thinking that the prices of building materials will be reduced in the near future. Mr. Torrence has many facts and figures showing that building-material prices are not out of proportion in connection with the many other things, and also that there is very little chance of their being reduced for some time to come.

The management of the show is taking steps to give it the widest possible publicity, so as to secure a very large attendance.

A Builders' Exchange has just been organized at Savannah, Ga., with a charter membership of sixty-one.

Mechanics Wanted for the Army

The Quartermaster Enlisted Reserve Corps, with recruiting headquarters at 357 Broadway, New York City, have received a new authorization to enlist men in their civilian trades in the army, for duty in this country and abroad. The men particularly needed at this time are:

Carpenters	Farriers
Masons	Horseshoers
Bricklayers	Saddlers
Plumbers	Blacksmiths
Electricians	Teamsters
Tinsmiths	Cooks
Iron Workers	Chauffeurs
Mechanics—General	Stenographers
Mechanics—Auto	Wagonmasters

Enlistment is open to citizens of the United States, or to those men who have declared their intentions of becoming citizens. They must be between the ages of 18-45 years and have no one depending on them for support.

Men who can qualify for the above positions will be examined physically at recruiting headquarters, 357 Broadway, New York City, and immediately sworn into service, and will be given a week or more time in which to arrange their private affairs before being called for active service.

The enlistment in the Quartermaster Corps is for qualified men, and military training as a soldier is not required in this branch of the service. They do not have to drill with rifles, perform guard duty or other purely military duties which fall to the lot of soldiers of the infantry, cavalry and other branches of the army, except in cases of emergency.

Another Church for New York City

A church and school building operation has just been commenced in West Seventieth and Seventy-first Streets, New York City, which it is estimated will involve an expenditure of fully half a million dollars. The work is being carried out in accordance with plans and specifications prepared by Architect Gustave E. Steinbach of 15 East Fortieth Street, who has had wide experience in architecture of this character. The general contractors are John T. Brady & Co., 103 Park Avenue, and J. B. Holbrook, 52 Vanderbilt Avenue, New York, is the engineer for heating and plumbing installation.

The church building fronts in West Seventy-first Street and the school will have its entrance in West Seventieth Street. The structures have been designed in the French Gothic style of architecture and the façades will be constructed of brick and stone. The church proper is 200 x 170 x 80 ft. in plan and will have a seating capacity for 1200 people. The parish house and school will be five stories in height and will have a number of classrooms each providing accommodations for forty pupils.

The first roof of asphalt shingles is said to have been laid in 1901 and to be still in service after fifteen years, as are also many others laid ten years and more ago, and to be practically as good as when first laid.

New Publications

Hendricks' Commercial Register of the United States for Buyers and Sellers. 2228 pages, side 8 x 10 in. Bound in boards. Published by S. E. Hendricks Company, Inc. Price $10.

This is the twenty-sixth annual edition of a standard publication devoted especially to the interests of the architectural, building, contracting, electrical, engineering, hardware, iron, mechanical, quarrying, mill, mining, railroad, steel and kindred industries. Full lists are given of producers, manufacturers, dealers and consumers, listing all products from the raw material to the finished article, together with the concerns handling these products from the producer to the consumer.

Some idea of the extent of the publication may be gained from the fact that the index to the trade classifications numbers 151 pages covering over 50,000 trade references. A new feature of this edition of the work is an alphabetical section which gives in alphabetical order the name, trade description, and address of every concern mentioned in the book.

A most valuable section printed on tinted paper so as to be readily found is a list of trade names, brands, titles of identification, etc., numbering 214 pages. By means of this list ready reference to descriptive products manufactured by concerns mentioned in the book may readily be found.

For the benefit of the readers of the Building Age it may be stated that the list of architects requires 28 pages of the volume, brick manufacturers 12 pages, building and general contractors 28 pages, lumber manufacturers and wholesale dealers 21 pages, masons' and builders' materials 11 pages, cornices and skylights 7 pages, sash, door and blind manufacturers 7 pages. At the close of the book there is an alphabetical list of advertisers requiring 20 pages. It may not be without interest to state in conclusion that the volume is bound with Du Pont Fabrikoid book finish.

Practical Structural Design. By Ernest McCullough, C. E. 303 pages, size 6¼ x 9 in. Bound in cloth. Published by the U. P. C. Book Co., Inc. Price, $2.50.

A knowledge of the principles of the various stresses that may occur in beams, roof trusses, etc., is of the utmost importance to the builder who is ambitious to make progress in his chosen calling, for knowledge of this subject marks the difference between doing work in a certain way just because others do it that way, and doing it in some other way because the principles of structural design are so understood as to enable the builder to know that the method used is correct beyond doubt. He can, therefore, meet new problems with certainty and ease, whereas his lack of knowledge of the principles involved would result in guesswork, likely to cause unsafe or uneconomical construction.

The builder who is desirous of increasing his knowledge of this important subject has generally been confronted with the necessity of understanding the principles of higher mathematics. Not so in the book under review, for the principles of structural design have been so expressed as to require only a knowledge of ordinary arithmetic. It is, therefore, especially adapted to the needs of self-taught men who have not had the advantages of a high-school education.

The material that forms the main substance of the book first appeared in the columns of BUILDING AGE, running serially for two years, and the insistent demand created for back issues containing this series clearly demonstrated the value of the information presented to those for whom the matter was specially prepared. In compiling the present work the author has considerably amplified the text, adding practically an equal amount of new material.

The field of structural design is well covered. The principles of moments, reactions, shearing stresses, elastic limit, modulus of rupture, etc., are clearly described. Practical problems in the design of girders, beams, trusses, etc., are presented, and the application of graphic statics to wind forces, stresses occurring in trusses, stresses in columns, stresses in structures, application of the radius of gyration, eccentric loading, wind bracing, etc., are all lucidly treated.

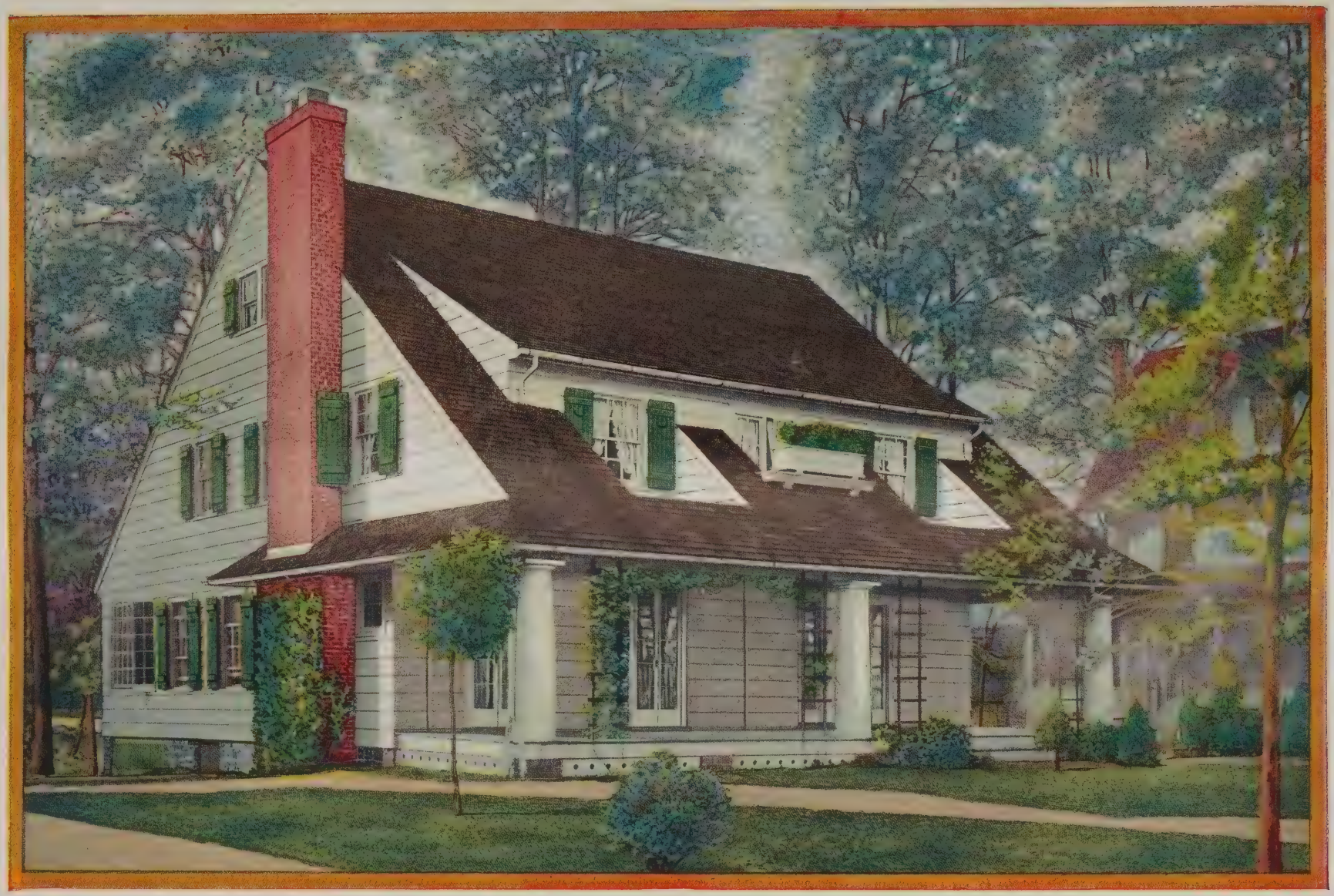
The author is a man of wide practical experience, and in his writing has the happy faculty of so expressing his thoughts as to enable the merest tyro to readily grasp his meaning. He is a licensed structural engineer and licensed architect in the State of Illinois, and is a member of the American Society of Civil Engineers. His high professional standing and well-known literary ability bespeak for the work a warm welcome at the hands of those seeking information of the character presented.

A Committee on Safeguarding Building Mechanics

Increased attention is being given to the matter of safeguarding those employed in building construction and there has just been appointed by the New York State Industrial Commission a committee of twelve to serve in an advisory capacity and to recommend rules and regulations governing building operations with a view to the safety of workmen as well as of appliances used in the work.

This committee consists of six labor representatives and six representatives of the employees. Three of the latter are from New York City and three from "up the state."

Good slate has a bright, silk-like luster and emits a clear metallic ring when tapped. Soft slate has a dull, lead-like surface and emits a muffled sound when struck.



BUILDING AGE
NEW YORK

A Frame Residence of Colonial Architecture at Pelham Heights, N. Y.

A Design of Compact Arrangement and Clever Treatment — The Sleeping Porch a Feature

THE well proportioned simplicity of the colonial dwelling that forms the subject of our four-color supplemental plate this month constitutes one of the outstanding features of the design. The lines of the main and dormer roofs are straight, but any appearance of sharpness is avoided through the slight break at each side where the lower roof line returns part way along the sides.

site so essential to the colonial type of architecture.

Casement windows open upon the porch from the living room, and the left part of the porch is screened off in summer so as to afford a pleasant outdoor addition to the house.

The shutters are of the familiar colonial type, and have the traditional crescent-shaped cut.

The rear view of the house shows the kitchen



View of the House of A. R. Van De Water, Showing Sun Parlor and Open Sleeping Porch
Architect W. H. Orchard, New York City

The front dormer is raised only slightly, the requisite window depth being gained by cutting back along the main roof as shown by the picture which constitutes our colored supplement, and as a consequence the main roof lines are kept predominant.

The porch floor is unusually low down and this, together with the lattice and large columns, helps to give the house the appearance of adaptability to

porch, the sun parlor, the second story sleeping porch, and the dormer window lighting this side of the house on the third story.

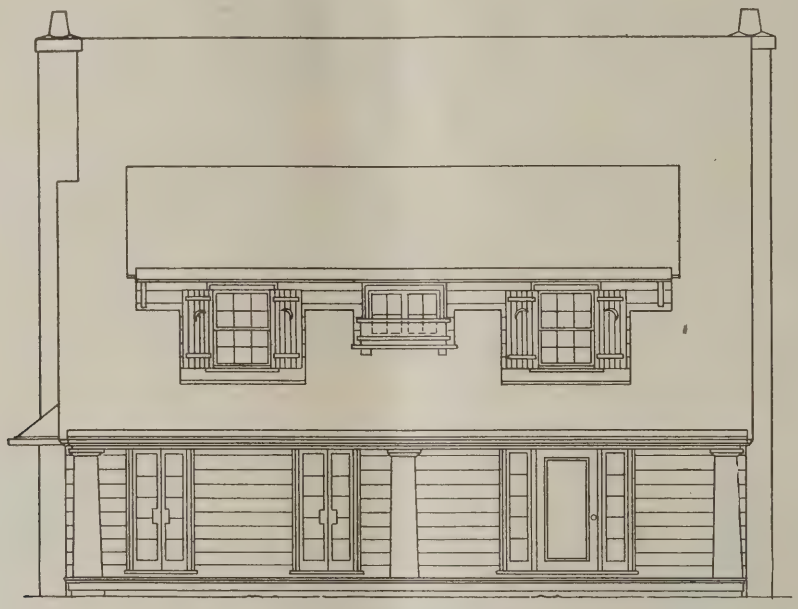
The usual colonial color scheme is carried out in the exterior treatment, the wide siding exposed 10 in. to the weather being painted white and the shutters green.

Entrance to the house is directly into a reception room or hall which contains the staircase. This

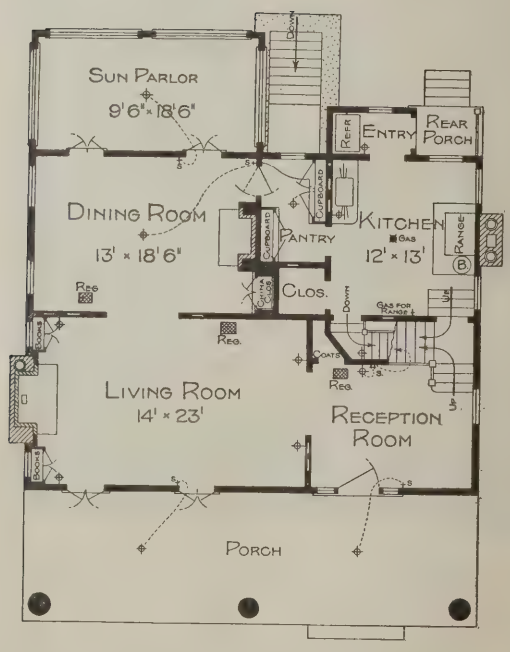
stairway is of the combination type and is so located as to afford access to the kitchen through the door which can be seen in the picture of the main stairs. The treads and rail are of birch and the risers are of white wood. The trim here in the hall, as well as throughout the rest of the house, is painted white.

To the left of the reception room is the living room, entered through a cased opening. At the far end, as shown in the large picture presented on another page, is a fireplace laid up with grey brick and flanked on either side by a bookcase containing diamond-shaped panes which are peculiarly in keeping with the colonial aspect of the interior. Over each bookcase is a small window.

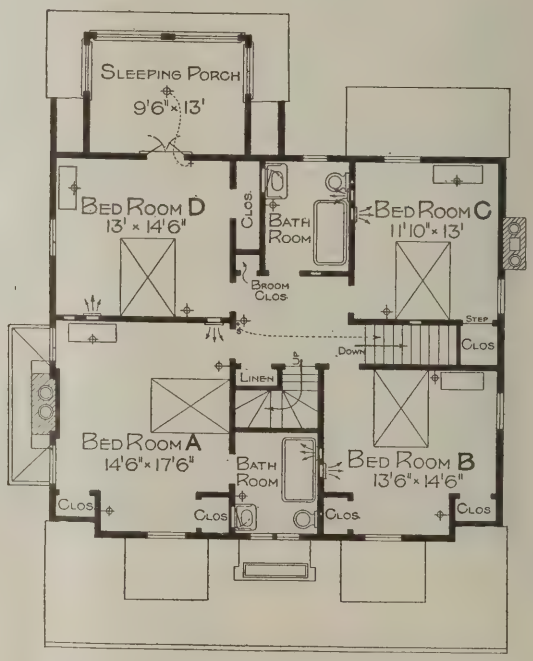
The floor here, as well as in the reception room and dining room, is double, the finish floor being of comb grained yellow pine. Trim throughout is of whitewood painted while, and the plastering was three-coat work.



Front Elevation of the Building—Scale 3/32 In. to the Foot



First Floor Plan



Second Floor Plan

Scale 1/16 In. to the Foot

Plans and Elevation of the Suburban Colonial Dwelling Shown on Colored Plate

At the left of the main entrance to the house are the casement windows opening upon the porch.

Beyond the living room is the dining room containing a fireplace laid up with red brick. At the

right of this is a china closet and at the left is the swinging door leading through the pantry to the kitchen. A paneled wainscot extends around the



A Cozy Corner of the Sun Parlor

room, and the picture which we present gives a good idea of the trim. It will be noticed that here, as well as in other parts of the house, the picture molding is taken high up to the junction of wall and ceiling.

In the view of the dining room taken from the living room, a glimpse into the sun parlor is had, communication being established by either of two doors.

The picture of the sun parlor shows the use of wide colonial siding for the wall, and broad windows which swing outward. One of the most interesting features in connection with the interior decoration is the tasteful use of antique furnishings, which harmonize so well with the spirit of the colonial house. The dining room table, the chairs here and in the living room, and especially the lace-hung bed in one of the second story chambers—these are all certain to attract attention from the lover of antiques and to cause many a remembrance of past days from the older members of the trade.

The second story contains four bedrooms, two tiled baths, and a sleeping porch. One of the bath rooms is entered only through the owner's bed room, thus being private to that particular chamber.

The foundation walls are of stone, with selected field stone used above grade.

The framing timbers are of spruce, the first and second floor joists being 2 x 10 in. and the third floor joists 2 x 8 in., all spaced 16 in. on centers. The studs are 2 x 4 in. and the rafters 2 x 6 in., spaced 16 in. on centers. A 7 in. steel I-beam is placed in the cellar, being supported by Lally columns.

The sheathing is of North Carolina pine which was covered with black Neponset building paper, this in turn receiving the wide colonial siding exposed 10 in. to the weather.

The exterior trim is of cypress, which received three coats of paint.

The front entrance door is of pine, being of a plain colonial type. The interior doors are of birch. Window sashes are of pine.

The house is wired for electric lighting and provision for gas is made in the kitchen.

The hardware is of a brass colonial type, lever handles being used on the casement windows.

The kitchen range is a Richardson & Boynton, as is also the heating equipment, which is of the hot air type. Pipes are covered with asbestos paper.

The cellar contains a laundry, laundry stove and water heater.

This colonial residence was constructed at Pelham Heights, New York, for A. R. Van De Water in accordance with plans and specifications prepared by Architect W. H. Orchard, 9 East Fortieth Street, New York City.



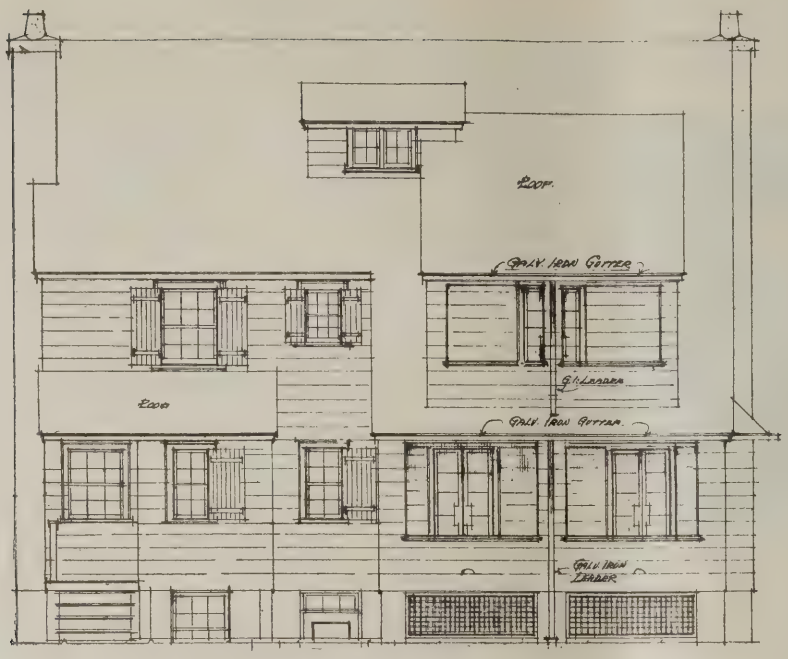
Interior of One of the Sleeping Rooms

Building Houses to Retain Heat

When a man builds a house in which he is likely to spend a half or more of his days, it is a matter of some little importance to him that it be well put together—not merely that it be constructed so that it will not fall down, but so that it will leak neither water nor weather. A leaky house is a misery and a misfortune. It is almost sure to be a permanent liability, says a writer in the *Heating and Ventilating Magazine*. In building, remember that no roofing is too good to cover your head. He who thinks to save money by using a cheap grade



The Main Stairs Rising from the Reception Hall



At the Left Is Shown the West or Rear Elevation of the House Clearly Indicating the Enclosed Sun Parlor with Open Sleeping Porch Above. The Rear Entrance Is a Feature—Scale 3/32 In. to the Foot

of shingles has much to learn at large cost. Shingles are not necessarily right because made of West Coast cedar, not because marked "Extra Star A Star." Before you buy shingles for your house, have the lumber merchant show you samples of all his stock. If he has a large variety, and something extra good, order the best he has.

There are other good roofs, some of them better than shingles, perhaps, but if you don't know how good they are, insist on seeing the material and on interviewing men who have used them before trying an experiment with them yourself. A leak in a roof is one of the most prolific causes of a chronic profane temper in the householder. A leak in the roof is worse than a rat in the walls, harder to locate and harder to be rid of.

There is also a science in the laying of roofs. Study that seriously before your roof is laid and see that it is laid scientifically. A careless or dishonest workman may make a bad roof of the best roofing material.

Next to water leaking through the roof, your worst elemental enemy is wind. Weather leaks through the siding and about the windows and doors are leaks in your purse. It is not an uncommon thing in any city for a householder to throw two tons of coal every winter through the cracks in his house.

Two tons of coal at $10 a ton is equal to the interest at 5 per cent on $400. Forty dollars added to the cost of material and labor put into the leaky house would have saved all this coal. When you are planning your house take a day off and look at all the varied kinds of felts and papers, fixtures and



At the Right Is Shown the South or Left Side Elevation of the House With Its Outside Chimney — Scale 3/32 In. to the Foot



The Living Room of A. R. Van De Water's Home, Looking Toward the Open Fire Place

fabrics that are on display designed to "stop a leak to keep the wind away." Among them you will find something vastly superior to the old tar paper and back plaster, and something that will probably cost you no more money. Remember this, that builders these days know better how to build a weatherproof house than they did 20 years ago. Don't let any behind-the-times contractor build your house; for if you do, the results are not likely to be pleasing to you.



The Dining-Room of the House, Looking Toward the Doors Leading to the Sun Parlor

Brief Review of the Building Situation

Figures Showing Building Activities in Various Sections in September, 1917, and September, 1916

INDICATIONS are not wanting that seem to point toward a gradual return to more normal conditions in the building industry in the near future. In all sections of the country, especially where infant industries are expanding or just locating, the demand for housing accommodations is increasingly urgent. This logical demand is not being filled, although there is a feeling that the Government may take a hand in the housing of munition workers, as England has done.

Building operations in 121 cities in September, 1917, show a loss of 26.66 per cent as compared with the same month of 1916. Of the cities reporting 40 show increased building activity.

The Eastern section of the country shows a loss of 15.85 per cent, with 17 out 47 cities reporting, showing a gain.

CITIES IN EASTERN STATES

	September, 1917	September, 1916
Albany	$150,572	$215,555
Allentown	77,580	74,540
Altoona	16,874	69,336
Atlantic City	39,787	186,877
Auburn	13,925	17,185
Bayonne	21,680	126,842
Binghamton	65,107	160,319
Boston	2,732,000	5,133,000
Bridgeport	615,147	547,541
Brockton	37,160	83,991
Buffalo	1,064,000	1,283,000
East Orange	88,238	403,620
Elizabeth	82,620	165,942
Erie	166,983	217,311
Harrisburg	204,255	406,075
Hartford	478,236	246,497
Haverhill	29,350	60,250
Hoboken	33,875	471,888
Holyoke	176,900	78,700
Lawrence	49,745	181,790
Manchester	58,774	138,536
Newark	616,297	579,573
New Bedford	113,275	380,300
New Britain	115,625	123,990
New Haven	2,741,879	323,945
New York:		
Manhattan	3,425,889	3,336,511
Bronx	302,313	780,863
Brooklyn	2,950,747	2,909,469
Queens	483,431	1,123,753
Richmond	440,619	125,783
Niagara Falls	168,410	235,265
Passaic	301,510	119,085
Paterson	139,920	142,827
Philadelphia	2,252,765	3,301,310
Pittsburgh	731,636	1,407,094
Portland	84,415	73,700
Quincy	147,982	136,605
Reading	257,500	163,075
Rochester	915,877	664,128
Salem	37,080	145,665
Scranton	123,303	70,648
Springfield	180,255	412,615
Syracuse	329,902	542,290
Troy	195,180	34,040
Utica	231,600	164,110
Wilkes-Barre	28,786	109,257
Worcester	247,793	587,050

The Middle section of the country shows a loss of 31.4 per cent, there being 5 out of the 38 cities reporting which show a gain.

CITIES IN MIDDLE STATES

	September, 1917	September, 1916
Akron	$1,165,400	$1,893,740
Canton	252,260	297,490
Cedar Rapids	97,000	177,000
Chicago	4,334,400	8,579,550
Cincinnati	798,915	862,030
Cleveland	3,310,075	2,713,780
Columbus	220,840	548,065
Davenport	68,870	122,945
Dayton	98,262	603,727
Des Moines	72,025	164,387
Detroit	2,275,795	4,868,545
Dubuque	28,525	57,100
Duluth	342,140	315,668
East St. Louis	175,936	57,235
Evansville	383,520	158,199
Ft. Wayne	518,960	329,630
Grand Rapids	182,190	169,405
Indianapolis	663,401	868,168
Kansas City, Kan.	100,047	51,460
Kansas City, Mo.	343,280	882,790
Lincoln	124,855	119,790
Milwaukee	969,118	961,946
Minneapolis	799,785	1,815,565
Omaha	756,640	715,705
Peoria	127,432	201,880
Saginaw	26,973	31,720
St. Joseph	25,210	48,995
St. Louis	858,162	1,794,770
St. Paul	290,462	442,410
Sioux City	254,439	183,750
South Bend	82,296	196,741
Springfield, Ill.	152,282	77,850
Superior	39,157	144,769
Terre Haute	118,968	44,127
Toledo	656,927	676,836
Topeka	189,980	42,601
Wichita, Kan.	206,940	87,815
Youngstown	287,040	395,245

The Southern cities show a loss of 48.44 per cent, with 19 cities reporting. Of these only 5 show a gain.

CITIES IN SOUTHERN STATES

	September, 1917	September, 1916
Baltimore	$230,130	$552,406
Birmingham	137,316	302,601
Chattanooga	40,331	79,272
Dallas	81,265	741,091
Ft. Worth	66,545	112,303
Huntington, W. Va.	63,345	72,180
Jacksonville	22,855	131,450
Louisville	80,600	201,510
Memphis	252,655	239,685
Montgomery	32,060	21,870
New Orleans	86,396	208,546
Norfolk, Va.	88,150	82,247
Oklahoma City	214,325	190,425
Richmond	95,780	339,455
Roanoke, Va.	17,255	154,683
San Antonio	120,065	85,055
Savannah	22,240	52,624
Washington	773,645	1,099,744
Wilmington	75,194	181,425

The Western cities report a loss of 34.75 per cent. In Denver there was a notable increase over last year while Portland and Los Angeles show a heavy decline.

CITIES IN EXTREME WESTERN STATES

	September, 1917	September, 1916
Berkley, Cal.	$52,400	$130,100
Colorado Springs	3,399	23,087
Denver	654,410	372,360
Los Angeles	613,865	913,173
Oakland	195,716	439,253
Pasadena	74,200	193,798
Portland	184,285	1,318,780
Pueblo	13,440	17,630
Sacramento	103,174	233,057
Salt Lake City	335,500	146,060
San Diego	55,203	251,309
San Francisco	1,137,685	1,263,485
San Jose	72,955	74,071
Seattle	441,800	629,140
Spokane	40,040	163,422
Stockton	57,968	31,550
Tacoma	102,308	142,692

It is said that the process of burying iron in concrete was practiced by the Romans at the time of Julius Caesar.

Rapid Work in Concrete Construction in Limited Space



View Looking Along the Line of the "Form" for the Wall

IN every large city there are constantly developing features of construction work which are of unusual interest to the progressive builder and contractor. These, in many instances embody points of suggestive value, for while they may be originally used in connection with large work they are of such a nature as to suggest some features or expedients that might be utilized to advantage by the builder on smaller undertakings but more or less similar perhaps in general characteristics. This comment is suggested by a piece of work now in progress in the city of Chicago and where a portion of the operations had to be conducted in a very narrow space subject to a heavy traffic. The unusual features are found in connection with the erection at Dearborn and Randolph Streets of the A. H. Woods theater and office building having a frontage on the former of 181 ft. 3 in. and 80 ft. 5½ in. on the latter and extending to an alley in the center of the block. The office building is ten stories high, occupying the corner facing the two streets and extends 72 ft. in Dearborn Street. The theater is two stories high and occupies the remaining frontage in that street.



Looking Toward the Alley Where the "Forms" for the Wall Are in Place and the Concrete Is Being "Poured" Directly from the Mixer

Owing to the present high price of steel the frame of the office structure is composed of a light steel core enclosed in reinforced concrete. The theater has a trussed steel frame. The entire

frontage on streets and alley is faced with pink terra cotta with a large sculptured group opposite the stage and an overhanging ornamental iron balustrade connecting with the balcony floor of the theater in Dearborn Street.

The foundation is a semi-floating type comprising five concrete filled caissons extending to hard pan 60 ft. deep to support the inner wall and carry part of the weight of a wall of the adjoining Schiller Building and the remaining columns are supported on 60 ft. piles with reinforced concrete cappings.

The alley in the rear is only 16 ft. wide but has a large amount of traffic. On the Dearborn Street side the excavation extends to the curb line which leaves only about 14 ft. clearance between the retaining wall and the street cars. This necessitated rapid work in very limited space in constructing the retaining walls. On the alley side the retaining wall is about 100 ft. long, 14 ft. high and an average of about 2½ ft. thick. Material was hauled in motor trucks and dumped in the narrow space along the side of Dearborn Street.

A permit was obtained to close the alley at four o'clock in the afternoon and promptly at that hour a 1/3 yd. "The Standard" Low Charging mixer was moved in the alley and set to discharge directly into the "forms." The mixer was in operation within five minutes after being moved into position and at 11 o'clock the same evening the "pouring" of concrete was completed and the alley cleared. The construction of the retaining wall along Dearborn Street was done in a similar manner and in equally rapid time.

The illustrations which we present show the narrow space available for operating the mixer and how the portability of the mixer made possible its being easily and quickly set to discharge directly into the "forms."

The architects are Marshall & Fox, of 38 South Dearborn Street, and the general contract was let to Longacre Construction Co., Inc., 36 W. Randolph Street, who sublet the foundations, footings and retaining walls to W. J. Newman Company, 19 North Curtis Street, all of Chicago.

Conveniences in Suburban Homes

A recent building operation at Garden City, L. I., has as a special feature various conveniences intended to minimize the housework incidental to a suburban home and to give advantages not usually present. Among the things provided are electric washing machines, vacuum cleaners, closets equipped with hangers, cedar closets for the storage of furs, rotary ash cans beneath the furnace so that the ashes need not be handled, ash dumps from kitchen range and fireplaces which empty into cellar receptacles and more bathrooms than usually present.

It is stated that the number of buildings devoted to human habitation in New York City is about 88 per cent of all the taxed buildings in the city.

The Home of the "Building Age"

One of the most important real estate deals ever recorded in connection with the trade paper publishing business has just taken place. The United Publishers' Corporation, 239 West Thirty-ninth Street, New York, publishers of some twenty or more leading trade and technical papers, including *The Iron Age, Dry Goods Economist, Motor Age, American Architect,* BUILDING AGE, *Metal Worker, Plumber and Steam Fitter,* etc., has purchased the building largely occupied by it, and commonly known as the McGraw Build-



ing, at 239-243 West Thirty-ninth Street. This is an eleven-story and basement loft building, measuring 194 ft. 6 in. front x 90 ft. deep and entirely occupied by publishing interests. This purchase was consummated through the acquisition by the United Publishers' Corporation of a majority of the stock ownership of the building. The deal was based on a valuation of the property of more than $1,300,000.

The building is ideally located, within easy access to both the New York Central and Pennsylvania terminals, and only three blocks from Times Square. The first floor is occupied by the Times Square Station of the New York Post Office; three floors and basement are occupied by the Federal Printing Company, which is the printing department of the United Publishers' Corporation; the four other floors are occupied by the publishing offices of the United Publishers' Corporation itself. This purchase guarantees to this publishing business a permanent home under ideal conditions and surroundings.

BUILDING AGE

THE DEALER'S DEPARTMENT

Impressions of a Building Age Traveler

An Interesting Talk on Methods by Which an Enterprising Dealer Built Up a Big Business

THE big touring car in the tonneau of which I had reposed in luxurious comfort for the past hour took a long steep hill with the ease which comes with reserve power. At the top I beheld stretched before me one of the most beautiful scenes imaginable. Winding down between the hills rolled the Clear River, its waters glistening in the sun. An auto road wended its way here and there along the banks of the stream and then was lost in necessary detours where the steep bluffs rising from the banks of the river made it wise for the road builder to leave the river and skirt the foot of the hill on the opposite side.

For miles on either side of the river between and over wooded hilltops cattle could be seen grazing on the slopes, and in the fertile valleys growing crops waved gracefully to the breeze. Here and there appeared a farm home, the well-painted buildings of which gave the final evidence of prosperity, while some miles to the north could be seen in distinct outline the town of Clearmont—our destination.

Your letter asking me to go to Clearmont and see John Goodman, the dealer in lumber and building supplies, had reached me at Rushton the previous evening. I was surprised at your insistence that I hire an auto and your suggestion that inasmuch as it was some fifty-odd miles, I had better get a big comfortable touring car and not attempt the trip in a Ford. Knowing as you do that Clearmont can be reached from Rushton by trolley for $2 for the round trip, or by using the branch of the C. Q. R. R. which runs up this valley for $2.30, it certainly pleased me to have you insist that I spend instead $20 for auto hire. Maybe you are beginning to appreciate the hard work I am doing and intend to be more liberal in future both in expense and salary.



"On one floor there were pretty girls parading up and down the center of the room, adorned in gowns, wraps, furs and hats of unusual beauty."

The hilltop from which I obtained my first glimpse of Clearmont is some thirty miles from Rushton, and the intervening country, although seemingly possessed of more natural advantages, gave no evidence of the rural prosperity which lay

between that vantage point and Clearmont. This was somewhat surprising, as Clearmont is located back in the hills near the small lake which is the source of Clear River. It was natural to suppose, therefore, that the further one traveled up the valley, and the nearer one approached to Clearmont, the less prosperity would be in evidence.

Growing Evidence of Prosperous Conditions

For some reason not yet apparent, however, just the opposite proved to be true. As we drove toward the north, now along the banks of the river, now through a fertile valley or up a long, easy grade, but always getting farther up into the hills, fields, fences, herds and farm buildings, all evidenced still more prosperous conditions.

At last we bowled over the long concrete bridge just above the dam, on past the paper mill, and turned into the main street of Clearmont. After several blocks of moderate but well built and well kept homes we came to the business section. Beyond the square, a block to the left, looking through a wide plaza could be seen the railroad station. Two blocks further on we came to a hardware store, and next door, in front of a fifty-foot building facing Main Street, with the entrance in the center and a big show window on either side, appeared the sign, "John Goodman, Lumber and Building Supplies."

Before Entering I Had to Get My Bearings

I told the driver to stop, but did not alight at once, as I had to get my bearings and make sure that this was really the place for which I was looking. It finally dawned on me that what I saw in the windows was a display of all kinds of building materials. I never knew, and could realize it was possible to make such an artistic arrangement of brick, cement blocks, shingles, prepared roofing, plaster, lath, etc. But there it was, a double window display of building materials just as attractive, artistic and effective as a Fifth Avenue department store window.

Upon entering, another surprise awaited me. As though accidentally placed, yet with pleasing effect, were all kinds of buildings in miniature in the construction of which different materials were used—sections of small houses, implement sheds, poultry houses, piggeries, dairy houses, etc. Just to look at these models and materials displayed in this manner created a desire to buy material and build.

Upon Entering I Was Invited into the Private Office

I took time to look over this unusual display while a young man evidently in attendance, without imposing himself upon me, conveyed the impression of being ready to serve me. Finally I asked for Mr. Goodman and handed the young man my card. Mr. Goodman appeared in a few minutes and invited me into his office, which was not elaborate but showed evidence of being the work room of a real business man.

After the usual greetings, I congratulated him upon the window display and showroom through which I had just passed. I told him such display was rather unusual and asked if he found it profitable.

I Congratulated Mr. Goodman Upon His Window Display

"Oh, yes," he replied, "it is profitable or it wouldn't be there. Why shouldn't it be just as profitable to display building materials properly as any other merchandise? The idea developed through a visit to one of your big New York department stores with my wife about ten years ago. As we were going up Fifth Avenue, she asked me to step into the store with her for only a few minutes while she got a shirtwaist and some other small articles.

"As we walked through the store, one thing after another attracted her attention; things she never thought of buying, but I must confess displayed in such manner as to make any woman want them. On one floor there were some girls parading up and down the center of the room, adorned in gowns, wraps, furs and hats of unusual beauty. I stopped to look at the girls and it cost me just $325, for while I was looking at the girls my wife was looking at what they had on. I know she had no more idea of buying a gown and a fur coat when we went into that store than I did. But to see the effect and imagine herself in one of those gowns and in that fur coat was too much for her. Finally she had me looking at the clothes instead of the girls, and I thought it would be kind of nice to see her dressed in such clothes, too. So a gown and a fur coat were added to our purchases, which totaled $340.

Why His Wife Bought More Goods Than She Had Originally Intended

"Now I knew my wife had no thought of spending more than $15, and if that merchant had kept his goods on the shelf where she could only have seen the edge of a roll, and the wrong side at that, $15 is all of my money he would have obtained. A pile of unattractive skins on the floor would never have made my wife want to buy a fur coat on a hot day in September, but those same skins worked up into the finished coat with beautiful silk lining and paraded before her eyes in such manner as to magnify every effect of beauty and utility, convinced her in ten minutes she simply could not live through another of our cold winters up here without a fur coat.

"As we traveled homeward next day some very serious thoughts came to me. Mr. Merchant had gotten that extra $325 of mine because he had worked fur, silk, buttons, thread, etc., into a finished product and presented it to us in such manner as to produce a desire to possess. If he hadn't done all this, my wife would have spent $15 and come home perfectly happy without the fur coat or the gown and the several other things we bought. Next winter if she really needed a coat to keep her warm, she would have gone into Kaufman's down the street and bought some kind of cloth coat for $25 or $30. But I did not regret spending this

money. My wife enjoyed these things and I enjoyed seeing her wear them. The pleasure and satisfaction we both got out of it justified the investment.

"But I had to make up that $325 somehow, and as I sat in the shack of an office which I had at that time, thinking the thing over the day after we got home, it came to me all of a sudden, Why not sell building materials like the New York merchant sells his furs, etc.? What, I thought, am I doing to show what this material can be used for or how to use it? Why can't I show the finished product in such manner as to create a desire to have these things the same as that merchant made my wife want the gown and fur coat? This idea got so big by night I couldn't hold it any longer, so I went over to see Jim Baker after supper. Jim is an old chum of mine and owns the hardware store next door.

"Well, we got started and talked until midnight. Maybe you don't think much of that in New York, but midnight in Clearmont is about half way between the proper time to go to bed and time to get up. Jim got interested, and said he wanted to get in on the deal, that he should at least be permitted to furnish the thread, buttons and trimmings. That was just Jim's way of reminding me that he sold nails, hardware, paint and glass.

"But Jim saw the point and said: 'John, we are certainly a pair of first-class self-hypnotists. We've been making ourselves think we were merchants and business men, which we surely are not. You've been storing the furs in uncarded skins with the rough side out where nobody could see them, while I've been hiding the trimmings in boxes back of the counter. I guess we never had the right idea of what merchandising really is. Instead of selling, we've been making it hard for people to buy and then wonder why we don't do more business. You've got an idea all right, boy. Let's sleep over it and see see if we can't dope out some way of making real merchants of ourselves.'

"Well, for the next week, Jim spent the forenoons in my office and I spent the afternoons in his store. We talked about more things than I could tell you in three days. Finally, we decided on much the same plan that you see here now, only not so elaborate. Of course, we had to have an architect to design these buildings, so the following week I went down to Rushton to look one up.

"Say, that was funny. Those fellows told me so much about the different periods and styles in architecture, and how you couldn't combine the Colonial with Italian, etc., that it made my head swim. But not one of them knew a darn thing about designing a $1,500 cottage or a practical dairy house. I was just about to give up when George Ross, a young man who was a draughtsman for one of these architects, came over to the hotel to see me. Said he had overheard my conversation with his employer and was interested.

"I looked up his record and found he was all right. He was a good draughtsman, understood designing and a good bit about building engineering, but he wasn't getting much pay because he hadn't yet reached the Renaissance period in his architectural development. It didn't seem to me we would need much Renaissance for a while, so I brought him along back. Joe Watkins, manager of the fertilizer plant we had started three or four years before, was a graduate of the Wisconsin Agricultural College and knew all about the housing and care of horses, cows, pigs and chickens, as well as what a dairy house looked like inside; so I put this young fellow up against Joe.



"When the 'Models' were ready they were loaded on a spring wagon and the salesman started out."

"Joe had been in on a good many of these talks with Jim Baker, and knew what I was driving at; so he undertook to line up young Ross and get him to understand what was needed. He gave Ross some books and suggested that we have him go out with Baker's man for a couple of weeks so he would get into direct contact with the farmer and farm conditions. Jim had a man out among the farmers most of the time selling farm implements. Well, after I turned Ross over to Joe I didn't pay much attention to him.

"About three weeks later he came into my office one day and began to ask questions about roofing

materials and the sizes and lengths in which certain lumber was cut, etc. After he got through, I asked him what he had on his mind. And what do you think this dainty little architect of a month before said? 'Chicken houses and pig pens.'

Why the Farmers Should Buy Chicken Houses

" 'What about them?' I asked. It seems he had been reading the books Joe had given him in his evenings, and going out among the farmers with Baker's man during the day, and he was all worked up. 'Why,' he said, 'it's awful the way some of these farmers take care of their chickens; no wonder they don't get any eggs and say they don't pay for their feed. The biggest wonder is the chickens don't all die considering the kind of houses they keep them in.' Then he told me about how each hen should have so many cubic feet of air space, how the roosts should be arranged, how the yards and runways should be fixed, how the sides of the building should be put up, and enough about chicken houses to fill a book. He said he had found several places where they had pretty fair houses, but had spoiled all by the kind of roof they had put on; that airtight roofing on a chicken house caused moisture to form, which would drop on the heads of the chickens at night and give them ——. He said he knew of at least twenty farmers to whom he could sell chicken houses right now and show every one of them that it was a good investment.

Arguments Used to Induce Farmers to Buy

"The neglected pigs were taken up next, and I listened to his story of how their growth was retarded by poor and improper housing; how feed was wasted by the use of the wrong kind of troughs, poor bins, etc. 'Why,' he said, 'I can show any farmer in this section that it will pay him to buy the kind of piggery I will design and that he will save enough in feed and the more rapid development of pork to pay for it inside of two years.'

"Ross seemed to have the practical side of the hen house and piggery pretty well worked out, so we rigged up a draughting board in the loft over my office and he went to work. Not knowing all about the Renaissance in architecture didn't seem to affect results, as I guess that would be hard to hitch on to a chicken coop or pig pen anyway.

"About two weeks later he showed me his drawings and specifications for the materials he wanted. Pinned to his specification he had a list of reasons for using the kind of material specified, as well as a brief outline of practical reasons for every feature of his design. Then he said he wanted models.

Buildings Were Designed on the Sectional Book-Case Plan

"This convinced me he had caught the idea and was going after these farmers in much the same way that New York merchant had caused me to part with my $325. So the models were made. We got prices from Jim Baker on the hardware, paint and glass, and got an erection price from a carpenter to put up the buildings after the foundation was in and the material on the ground. This enabled us to quote a price erected except for cost of foundation, which would vary. He had these buildings designed on the sectional bookcase plan, so that he could quote on a twelve-foot building with so much added for each additional six feet.

"When the models were ready he and Baker's man loaded them on a spring wagon and started out. We didn't hear anything of them for five days, and then one evening just as Jim and I were starting for home they drove up, smiling from ear to ear. They had orders for eleven piggeries and fourteen hen houses, none less than 18 ft. in length and some as long as 36 ft., a total business of over $5,000, all in the sale of material the purchaser didn't know he needed and had no idea of buying until he saw the models and was told why it would make a good investment for him. Well, that was the way it started.

Designing the Showroom and Office Building

"The next job for Ross was to design this showroom and office building. Fortunately, the railroad runs through the next street, so that we could have our show windows on Main Street and still be in the yard. Ross kept on designing different kinds of buildings and working up models, costs and selling arguments. He studied out the cow barn and other farm buildings, with the aid of Joe Watkins' books and advice, the same as he had the hen house and piggery. Then he got up a lot of plans for farm homes, cottages for the town folk, etc. We put on two salesmen the first year; now we have six."

"But," I said, "a salesman can't carry all those models."

No Longer Necessary to Carry "Models"

"Oh, we got away from carrying models long ago. When a customer wants to see a model, he comes in here. This is what the salesman carries now," and he opened a case which was made to fit on the back of a Ford runabout. First thing he pulled out was a portfolio of photographs of all kinds of buildings, from a residence which cost $6,000 to a 12-ft. hen house for $150; photographs of all views, with simple plan sketches which anybody could understand. Specifications merely told in plain English what kind of material would be used. They didn't sound a bit as though they had been written by an architect—which made it possible to understand them.

Use of the "Sales Manual"

Next came a sales manual which told all about different kinds of lumber, where it came from, how it worked and finished, etc. Every kind of building specialty was listed, with information as to its merit and use. As I glanced through this I asked if the salesman read it.

"Well," said Mr. Goodman, "they don't have to read it very much after they become salesmen. Every man must know what is in that book backwards as well as forwards before we assign him a territory and give him a car and a kit."

The rest of the case was filled with samples of

lumber and materials of all kinds—brick, roofing, plaster board and whatnot.

As I sat in amazement, trying to grasp the minute detail with which this whole selling scheme was worked out, Mr. Goodman reached for the 'phone, remarking he would get "Jim" and we'd all go up to the hotel and have dinner. Mr. Baker was busy and couldn't go for a half hour, so Mr. Goodman suggested we walk out into the yard meanwhile.

I am sending you some pictures of this yard; but you can't appreciate it from pictures or description. It extends for a distance equal to about five blocks between Main Street and the railroad tracks, which are about 300 ft. apart. Cottages for employees are built along the street on lots 75 ft. deep.



"Later the models were kept in the store and the salesman carried a portfolio of photographs of all kinds of buildings with simple plan sketches which anybody could understand without any great amount of personal explanation."

The siding is elevated, so that all lumber in unloading reaches pile or shed on roller track by gravity. Under every pile, whether in the open or shed, are concrete posts with old trolley rails reaching from one post to the other. This foundation, Mr. Goodman explained, kept the lumber straight and insured against dry rot from ground moisture. He said the reduction of wastage from these causes had paid the expense of putting in these foundations in less than two years.

Sheds are arranged under the elevated siding for storing cement, brick, roofing, etc. A portable elevator, on low, flat wheels, with an arrangement for fastening behind a motor truck and operating with the engine of the truck, is used in unloading and loading this material.

About two-thirds of the way down the yard is the mill. This mill, Mr. Goodman explained, is used only for preparing lumber for these buildings of standard design; all doors, sash, etc., are bought of the manufacturer.

Beyond the mill are sheds in which this finished material is stored. All materials for each type of building have specific space assigned to them, and here is collected not only the finished lumber, but the roofing, plaster board and everything else needed for this particular building in quantity and size required.

The designer has reduced this cutting to the minimum; pieces of the same dimensions may be used in the piggery, the dairy house, implement shed and cottage—possibly not in the same place or just in the same way, but in such manner as to reduce cost of mill work and number of finished pieces necessary to carry in stock.

Further on is a plant for making concrete blocks, a stable and garage.

As we came back, Mr. Goodman said: "We'll go through this way," and we entered Baker's hardware store through the warehouse which adjoins the Goodman lumber yard. This was a two-story building 100 by 200 ft., and packed with all kinds of farm implements, machinery, fencing materials, etc. The hardware store showed evidence that Jim Baker and John Goodman had kept apace in up-to-date merchandising methods. I was introduced to Mr. Baker, and we all went to the hotel for dinner.

After we had finished eating and were comfortably seated with good cigars on the side porch of the hotel, facing a beautiful stretch of lawn with a vegetable garden in the rear, I asked Mr. Baker if he knew Bill Smith who traveled for the United Hardware Co.

"Yes," said he, "I remember Smith. He used to sell my father hardware when I was a boy. He hasn't been through this way, though, for years."

"No," I said, "he told me last week in New York that he hadn't been to Clearmont for fifteen years; said the Clear River Valley above Beaver Dam was too poor to buy shoes and clothing, let alone hardware. He advised me to bring my lunch with me if I came beyond that point."

John Goodman and Jim Baker both indulged in a hearty laugh; then Baker, with a faraway, reminiscent look, remarked: "I guess that would have been pretty good advice to follow fifteen years ago. But it has changed since then."

I saw there was something back of this, and my curiosity was on edge. "What," I asked, "has brought about this change?"

Comparing Present With Past Conditions

"Well," said Baker, "a lot of things contributed to it and it seemed to come about rather naturally; but when you compare conditions as they are now with those fifteen years ago, there is quite a contrast. My father and John's father were about the only two men this side of Beaver Dam at that time who had one dollar to rub against another. They had made a little money out of timber land. Clearmont was a town of about five hundred, with nothing to support even that population. The farmers were poor and getting poorer. About the only thing you could raise on most of the land was a disturbance.

"John and I had been sent away to school. He took a business course and had a position with a big retail lumber house in Ohio. I was in Cleveland studying law, when John's father was taken sick and he had to come home. That was fifteen years ago last March. His father had the lumber yard, but his sales for a single year wouldn't keep Clearmont in kindling wood for a week now. John had to stay here and take care of his father and run the business, such as it was.

The Part Played by John's Sister

"The following July I came home to visit my father and mother. I found John in the dumps about being tied up in this God-forsaken hole and didn't blame him. If it hadn't been for John's sister, who had just returned a graduate from Smith and who is now Mrs. Baker, I don't think I would have stayed the week out. But circumstances caused me to linger. One of the circumstances was Joe Watkins, who was visiting John and who was entirely too attractive an individual to be left behind, with John's sister the only interesting girl within twenty miles.

"Joe was a graduate of the Wisconsin Agricultural College. He had studied soil analysis, fertilization and all such stuff. One day, as we three boys were walking back in the woods, Joe kicked up some black dirt and put it into his pocket. When he got home he analyzed it and said it was rich humus; that if you took this humus, added certain chemicals and used it for fertilizer you could grow anything on the farms around here. And that is really how it started.

Borrowed Money to Start the Business

"John and I each borrowed $1,000 from our fathers to start a fertilizer factory. We carted this humus down to the mill, where we mixed it with chemicals according to Joe's instructions. The first year we only sold twenty farmers, but they had such unheard-of crops it was easy to get the others interested. Of course we had to trust them until they got their first crops, but Clear River Valley began to produce wealth.

"One reason we couldn't sell lumber and hardware before was because no one had money. Well, we got the farmers started to making money. Joe started a creamery. He said there were acres of pasture land that weren't good for anything else, and the farmers ought to keep stock. While Joe was buying their cream John was selling them cow barns, dairy houses and silos, and I was selling them cream separators, milk cans, wagons to deliver their cream, etc.

Starting a Paper Mill

"Of course, this all helped the town and brought money here. We have a population now of about three thousand. John and I found a stretch of good pulp timber the old gentleman hadn't thought it worth while to bother with, and started the paper mill about six years ago. That helped to bring more money and more people."

"It seems to me," I said, "that both of you carry a big stock of goods for a town of 3000 population."

"Oh," said Goodman, "we work the whole valley from Beaver Dam, 15 miles south, across the ridge to Glen Springs, 20 miles north. The C. Q. branch ends at Glen Springs. We have three warehouses between here and the Dam, and two between here and the Springs. We use these warehouses to receive cream and distribute fertilizer, farm machinery and lumber. Jim has eight salesmen and I have six out on this territory all the time. If a dollar ever starts to get out of this valley without coming through Clearmont, we have a man right there to head it off and bring it back."

Mail-Order Competition

"Do you have any trouble with mail-order competition?" I asked.

"Mail-order, nothing!" exclaimed Goodman. "Our men are there and have an order before the customer, without our help, would realize his need."

"Yes, and the town trade amounts to a good bit," interrupted Baker. "John chases every pay envelope, and when he finds one to contain a few dollars more than is actually needed to support the family, he proceeds to show photographs and models of the nice little home those few extra dollars each week would pay for in five years. As a result, 90 per cent of the population of Clearmont literally sleep under their own roofs and mow their own lawns."

Starting a Bank

Goodman smiled and said: "Tell him about the bank, Jim."

"When we first started the fertilizer mill, we had to carry the farmers, and thought it would be a good thing if we had a bank here. So John and I went to Beaver Dam and put the proposition up to the Hon. Joseph Mendel, who owned the bank there. We wanted him to start a branch in Clearmont.

" 'What,' he said, 'start a branch bank in Clearmont? Why, nobody up there has any money!

Cobwebs would grow over the receiving teller's window. Oh, yes, I guess I could loan all the money I would send there, but I would never get any of it back. That country is dead; too poor to feed a sparrow.'

"Two years later we started our own bank, and the Hon. Joseph's bank which was is now a branch of ours.

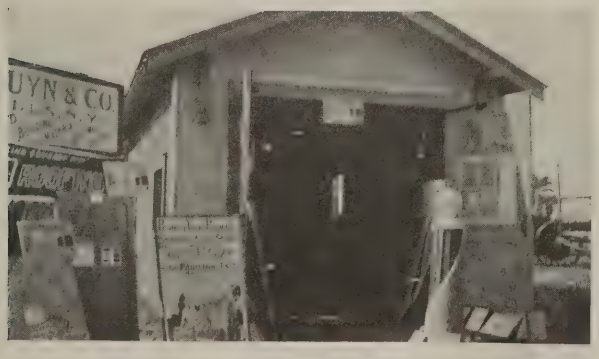
"Yes," continued Jim, with that reminiscent look again coming over his face, "Bill Smith was right. Fifteen years ago this town was so dead you could set a hen anywhere along Main Street and she would never be disturbed. But it's different now. Of course, Joe Watkins' fertilizer idea and creamery really started the production of the wealth we have, but we never would have known how to keep it here and have this business done through Clearmont if John hadn't been stuck $325 for that gown and fur coat about ten years ago in New York. That is what started us to thinking and made real merchants and business men out of us."

And so it was explained why the further up the Clear River Valley I went the more prosperous conditions prevailed, not because Nature had more richly endowed this valley north of Beaver Dam, but because two young men, neither of whom has yet passed his fortieth birthday, took advantage of circumstances, made the valley to produce wealth and, of still more importance, kept that wealth in Clearmont through their progressive business methods.

Garage Exhibit at Washington County Fair

One of the very interesting exhibits at the Washington County Fair recently held at Hudson Falls, N. Y., was that of Finch, Phuyn & Co., Inc., of Glens Falls, and in the accompanying pictures we show the garage referred to in the description furnished by the company and which here follows:

"The garage was 12 by 20 ft. in plan, 9 ft. high, and with car door opening 8 ft. high and 8 ft. wide. There were two windows on one side and one window and door on the other, with lights in the upper half of the door, thereby giving sufficient light to work on the car.



View of the Garage with the Doors Open

"The framing for sides and roof was of 2 x 4-in. material placed 16 in. on centers, the plates being 2 x 4's doubled. The exterior was enclosed with Bishopric stucco board and the roof was covered with Standard Paint Co.'s slate surfaced shingles. The front was finished with "Elastica" stucco, which made it a fireproof proposition.

"Our exhibit consisted of panels of Upson board, finished by the Bridgeport Wood Finishing Company; doors and trim by the Iroquois Door Company of Buffalo, N. Y.; Morgan doors from the Morgan Company of Oshkosh, Wis., and finished by the Bridgeport Wood Finishing Company; United States Gypsum Company's products; Standard Paint Company's Ru-ber-oid roofing, and Russell-Irwin hardware.



Representatives of the Exhibiting Companies



Some of the Products Making Up the Exhibit

"The above companies had their representatives on the job and they were kept on the jump looking after their interests. It has proven a wonder as a business getter; in fact it has gone way beyond our expectations. We have prospects enough to keep us busy for two months. The garage was sold to the Satterlee Hose Company of Fort Edward to house their fire truck. It was considered the greatest attraction at the fair."

A steamer which recently sailed from Portland, Ore., for Shanghai, carried as its cargo the largest amount of big dimension stuff sent out in recent years from that port. The largest pieces of timber in the steamer's cargo were 40 in. sq. at the end and the smallest pieces of lumber placed aboard were timbers 18 in. sq. at the ends and 40 ft. in length. The entire cargo comprised something like 4,000,000 ft. of dressed trees from the forests of Oregon.

Annoying Practices in the Lumber Trade

Instances of Unethical Methods Which Members of the Trade Are Likely to Read with Interest

By C. E. Davidson

In the following are given some instances of unfair practices of the saw mills with the retailer. I find that there is not a single lumberman any place who can not refer to some instance where he was unfairly treated. Often he says it was "not really enough to kick about," and besides, "what can you do?" It doesn't pay to hire a lawyer and sue. The amount involved may not be great.

Mills Make the Grading Rules

The mills make the grading rules. It is a notorious fact that no mill expects a retailer to be satisfied with lumber which only meets the grading rules. If the mills really shipped lumber which only met the grading rules, the retailers would rise up en masse and refuse to do business. The rules are made by the mills for one main purpose—and that is to settle disputes by. For instance, the average mill aims to ship a really fair grade, and generally does, but there are cases where a thousand feet or more falls below the actual grade usually shipped, yet it will all come within the grading rule. For instance, take a No. 2 common yellow pine board, such as we usually call a barn board, because used for such buildings. Now, the usual barn board is a very good board, but the grading rules allow boards which are practically culls to be added in shipment. For instance, No. 2 common boards may contain knots which cover one-half the cross section of the piece, worm-holes, splits one-fourth the length of the piece, wane two inches wide, or through heart shakes, one-half the length of the piece; through rotten streaks one-half inch wide one-fourth the length of piece, or its equivalent of unsound red heart, or defects equivalent to the above; a knot hole two inches in diameter; miscut boards, including thin stock, etc.

What Is a No. 2 Board?

Now, what would such a board look like? A No. 2 board must now be sold for $3.50 per hundred. What would a customer say if you charged him $3.50 per hundred for such a board? No lumber dealer attempts to put such a board off on his trade. He simply drops all such boards down into the cull grade and gets what he can for them. If a complaint is made the manager of the mill reports that he has investigated and finds from his superintendent the car graded all right but that if not satisfied they will have an association grader come, and, if he finds stock below grade, credit will be given, and if not the retailer pays all expenses, etc. Now the association grader would not find the stock below grade, because the grading rules are made for just such instances. If not made for that, then for what? No mill attempts to put off such low grades upon its trade. The result is that the retailer is too smart to ask for the grader, and, after a long correspondence, secures what little reduction he can and pays the bill. The only recourse he can have is to quit trading with that particular mill, but the difficulty is that almost all mills are at times guilty.

Samples of Trade Literature

"Oh," says one, "don't you know the Southern Pine Association has an organization to promote the lumber industry, with departments, etc.?" Yes, I know all that. I know they have had printed some splendid circulars which retail lumbermen can buy if they want them. These, of course, advertise the yellow pine product. Last month I received through the mail nine small pamphlets, on three different subjects, with a request that I send to the Association nine cents to cover postage, which with the postage required to return them, cost eleven cents. There were not enough of them to do any good, and therefore this was waste.

Committees for Various Purposes

But one says, did you know the association has a graphic outline of its service? There lies in front of me a finely printed page which has graphically outlined its service. It reminds me of the old plan, back in my boyhood days, when we went to the blackboard in the grammar class and drew lateral, horizontal and diagonal lines, and on which we put subjects, predicates, verbs, etc. It has committees on grading, etc. I have just discussed the grading rules. The next committee is on transportation, with elaborate details, but just why a car after being shipped is apt to stay on the road a month or more is a mystery, and I wonder just what this nebulous transportation committee does. Next committees on accounting, terms of sale, fire prevention, trade expansion, etc., but as I get it, all this service is for, by, and in behalf of the association and not for the retailer.

Secure Relief Through Agitation

It is not pleasant to complain and to point out the frailties of others. People as a rule don't care to hear of others' troubles, but my idea is that since we are constantly harassed by unfair treatment we can only get relief by agitation. Let some one suggest a remedy. It might be a board constituted in part

by wholesalers and in part by retailers, to whom all complaints should be submitted. Where the retailer is unfair, he should be told so, and where the wholesaler is dominating and unfair he should be informed.

The Question of Grades and Shipments

My own idea is that all executives of the mills would resent the imputation that they are unfair in any way or that they would not take pains to make a wrong right. Yet the cold facts still exist. The shipping question and the bad grades are here. Not all the time, of course, but just enough to aggravate. It can't be said it cannot be avoided. It is avoided by the cypress mills, and there is no reason why the pine mills cannot accomplish the same thing if they want to do so.

In the last issue of BUILDING AGE I asked for statements from retailers of instances where they had been unfairly treated, and below submit for this issue some instances. More will be furnished later.

Details of Example No. 3

The Kennedy Corporation, Danielson, Connecticut.

The above company has forwarded to me the correspondence and orders respecting an order which was placed by them with a concern in Torrington, Conn., Feb. 6, 1917, for a car of 1 x 6 pine roofers d2s, etc. An invoice was sent the company by the mill March 3, 1917, for the stock, but was immediately followed by a letter cancelling the invoice and stating the mill had failed to make shipment because of an embargo, and that it was diverted to another point, but that it (the mill) would ship another "just as soon as possible." In October the company taking the order refused to make shipment except at an advanced price, saying mill refused to ship except at advanced price, relying upon their inability at the start to make prompt shipment because of embargo as an excuse, notwithstanding they retained order with promise of "shipment just as soon as possible," thus retaining the confidence and expectations of the Kennedy Corporation that the car would soon be shipped. It will be noted now that no claim is made of delayed shipment because of embargo.

Mill Ready to Ship If It Secures the Price

The mill is ready to ship if it can have the advanced price. The mill no doubt understands the Kennedy Corporation is not going to sue them for the difference represented by the advance in price; that it could not afford to go into a foreign jurisdiction, employ lawyers and enforce their righteous demands, in other words, make the mill keep its contract. There is nothing in the order or the correspondence which shows that "time is essence of the contract," on the contrary, it is clearly inferred that both parties to the contract were waiting on the embargo and that as soon as it was raised shipment would be made. The mill representatives hide behind the clause in the contract that orders are taken subject to delays of carriers, etc. Very well. This is admitted. That is, had the mill not made a quick shipment it could have made this claim if damages had been demanded because of delayed shipment, in event the mill had shipped, but the Kennedy Corporation are not making any such claims.

The Truth of the Matter

They are now and have been willing all along to receive the car, in fact were led for six months to expect shipment. The truth about the matter is, as I see it, the mill ought to make the shipment. While its terms have considerable to say about delays and matters beyond its control, yet there is no agreement in the contract that they can refuse to ship if the price goes up, which it did in this instance. Suppose the tables had been reversed, and the market had gone down, and the Kennedy Corporation had refused to receive the car on account of delayed shipment? What then? Why then the mill would no doubt have referred very vigorously to their terms about not being responsible for delays in transits, the embargo, and perhaps in that event would have had the right to do so. The Kennedy Corporation was keeping its contract all summer long, and the mill was holding the order under its agreement to ship "just as soon as possible," and I cannot see by what plea the mill now can break its covenant and agreement to ship. The logic of the mill is that because of the embargo it is not required to take a price less than the market.

Suppose We Adopt the Logic of the Mill

All right, suppose we adopt the logic of the mill: Then, after a retailer orders a car of lumber if the market advances he must pay the advance, and if this be true, then compelling logic would require that if the market goes down the mill must make a reduction. There can be no other conclusion, as I see it. Do the mills want to establish such a rule? What is sauce for the goose is sauce for the gander, is it not?

This is but another instance of the multitude of unethical matters which are constantly occurring by the thousands every month all over the United States, in which mills are eluding their just and legal obligations, under some pretext or another, and to which I referred in the October issue of the BUILDING AGE.

Details of Example No. 4

An Illinois company, which does not desire its name given, because, as it states, "the matter is really too small to make much of a howl about," complains to me of the following instance:

One of the largest mills in the south, a yellow pine concern, accepted an order for a car of flooring in February, with the notation on letter of acceptance that if freight rate should advance buyer must pay same. The shipment was not made for four or five months, and just about the time that it was made an advance in freight rates went into effect. The car arrived in due course, the freight was paid by the retailer as usual and credit taken for it. After a time the mill wrote and demanded an extra $5 as additional freight the mill had to pay. The retailer has not yet paid it, though he expects to do so. Had a reasonably prompt shipment been

made, no extra freight would have been earned.

Here is another instance which shows that a mill takes every advantage possible. In instance No. 3 given in this article, the mill tries to take advantage of its virtual cancellation because they could not get cars just when they desired them. In this instance a mill made a delayed shipment, claiming in general terms car shortage, which made the shipment very much delayed, and that, therefore, because of this shortage, the buyer must pay the additional freight. Naturally the buyer retaliates by saying if the mill had shipped the car within ninety days there would have been no extra freight. The mill claims it could not get cars. I have no doubt that this mill shipped thousands of cars to various points within that ninety days, as it is the largest in the South and no doubt made some shipment. Likely it suits its convenience to fall back on "car shortage" excuse as an explanation of all its sins.

The "Car Shortage"

The "car shortage" bugaboo is growing very tiresome. Car shortage no doubt exists somewhat, but not to the alarming extent the mills would have us believe. For instance, I know of one firm which had some orders in the South with a mill on the Illinois Central Railway. Word was sent mill could only make shipments over the I. C. because the I. C. would not let their cars leave their tracks. The retailer who lived within twenty miles of the I. C. railway answered and told them to ship the car to the nearest town on the I. C. and he would have it unloaded and sent to his town in another car. The mill having had its "hand called" answered that would not be necessary as they now had a car, and made immediate shipment, which showed the excuse was not a valid one.

I find that many lumbermen hesitate to "tell their troubles" but are anxious that others do so, and hope something can be done, etc. The only way is for every lumberman to send me their complaints. Send correspondence, invoices, etc., if convenient, or if not that, send a detailed statement so I can have all the facts and will not misrepresent anything. We want to be fair. The truth is bad enough. Send your complaints to me at Greenville, Illinois.

Attitude of Architects Regarding Dealers' Plan Books

An interesting controversy, which may spread to other States, has arisen in North Dakota between the architects and the retail lumber dealers who make a practice of utilizing plan-book systems in their business.

Of late, great emphasis has been placed on the necessity of the retail lumber dealer becoming a better merchant. As a part of the improvement in business methods, dealers have been urged to make a practice of selling "the completed structure," rather than just "lumber." Throughout the country there have been organized a number of companies whose object is to supply lumber dealers with plan books, and some of the retailers' associations maintain plan-book departments which are at the service of their members.

What the Plan-Book Systems Do

These plan-book systems furnish plans and specifications complete for a large variety of buildings, and by their use the dealer is able to present to his patrons something concrete and complete, instead of merely filling bills of material for barns, houses, and other buildings. Some of the mail-order concerns furnish similar service.

In Illinois there is a law which was designed to protect the retail dealer from the mail-order houses. It provides that those doing this kind of business must either operate in the State or obtain a State license. But in some other States, measures of this kind are designed to protect the architects.

The North Dakota Law

The North Dakota law is such a measure. It provides for licensing architects, and "no person shall begin to use the title 'licensed architect,' or any variation of the same, or any other words, letters or device to indicate that the person using the same is a licensed architect, after the approval of this act, without being registered as a licensed architect in accordance with the provisions of this act."

A provision is made, however, that the State Board shall accept satisfactory evidence as to an applicant's qualifications where it can be shown that he has actually been engaged in the practice of architecture in the State for at least a year prior to the enactment of the law, and the registration fee is $25 for the first year, renewable at $15.

Action by the State Association of Architects

Recently a member of the North Dakota State Board of Architects wrote to several lumber companies doing business in that State, calling attention to the act and to the fact that they were making drawings and specifications as architects. This action was taken at the instance of the State Association of Architects, who believed that they should be protected from outside competition since they were obliged, under the law, to take out licenses.

Whether or not the law of North Dakota, and the similar laws in other States, will prevent line yard companies from furnishing plan-book systems to their various agents, and plan-book concerns located in other States from supplying similar service, is yet to be determined. It may be possible that the line yards and the plan-book concerns can take out licenses in the States where licenses are required, and make their yard managers and patrons agents.

Another Improvement

"Is there any interior decorating going on in your town just now?" asked the visitor to Grizzly Gulch.

"Well," replied the local paperhanger, "up at the hotel yesterday we hung a boarder."

Relations Existing Between the Dealer and the Building Contractor

The Question of Discounts on Purchases of Materials—The Course for the Country Dealer

By "The Old Retailer"

THE building material dealer is not very long in the business before he discovers that contractors consider themselves as preferred customers and therefore to be treated accordingly, and as his personal experience accumulates in dealing with them he comes to regard them as a special class to be dealt with in a way different from other folks. Most people who go into a retail business of any kind do so with the plausible idea of treating everybody alike. They think that as one man's money is as good as another's, no favors should be shown. But they soon find out the difference between theory and practice in dealing personally with the individual customer.

This theory is all right in principle, however, and has been carried out with success by such large concerns as the mail-order houses who sell goods without coming into personal contact with their patrons. Their system of "One Price to All" is so well understood that people no more think of asking for a discount than they would of requesting the post-office to give them a reduction on the purchase of a large amount of stamps. There is no question but that the retail building material dealer would prefer to sell his goods by this method, and would gladly adopt it if the nature and conditions of his business would permit. But, unlike the mail-order house and the post-office, he has the close competition of other dealers to contend with, and also that of the contractors who buy in larger quantities than the average customer.

The owner who buys his materials for a new building direct from the dealer, is only an occasional customer, but the contractor is buying more or less in large quantities all the time and therefore he believes that he is justly entitled to receive a discount on all he purchases and to being treated more favorably than the man who is a "now-and-then" customer. This attitude of the contractor is tacitly accepted by the majority of dealers in the larger cities, but as a rule, the country town dealers do not recognize his claim to be treated differently from anybody else, insofar as giving him a regular discount is concerned.

There are special cases, however, that the country dealer feels warranted in favoring the reliable contractor with a discount as an inducement for a continuous patronage, but to give it to one contractor, and not to the others who deal at the yard, is taking a risk that is full of danger. Therefore it depends on the character of the man to whom the favor is given, and the dealer should be sure of his man before he makes him his favored contractor. Otherwise, if it leaks out that a certain contractor gets favors at a yard where other contractors cannot, the result will be disastrous to the trade of that yard.

We all have our theories about how things ought to be done. Nevertheless, we are governed largely by the conditions of our environment, and this is eminently true in the business of running a country yard. It is here as elsewhere, that the securing of business is largely, if not wholly, a matter of inducing people to come and trade, and since contractors are a class that buys the largest amount of materials during the course of a year, they are going to trade most with the yard they

The author calls attention in the present article to some pertinent truths regarding the retail lumber business and the relations existing between the dealer and the building contractor.

It is pointed out that the reliable contractor is frequently favored with a discount on purchases for the purpose of inducing continuous patronage, but the risk of giving a discount to one and not to another is very great and likely to react on the country dealer who indiscriminately follows the practice.

It seems to be generally recognized that it is better for the average country dealer to sell to two or three reliable contractors than to invite bids from every man who can push a plane or handle a saw for the reason that the latter are not always competent to make correct estimates.

The question of filing a lien to secure payment for materials purchased is discussed in a way to command close attention, and the views expressed are based upon the practical experience of the author.

If there are to be any misunderstandings it is far better to have them beforehand rather than afterward.

Precautions should be taken in regard to sales and shipments of materials so as to avoid all possibility of error.

consider offers the best inducements whether in the form of discounts or anything else.

Contractors Necessary to the Dealer

However, it may be the back thought of dealers that they would prefer to get along without the contractors, yet the fact remains always in sight that they are a factor in the business and must be tolerated with as little friction as possible. Every town has its own peculiar conditions in this respect, and the dealer has to treat each individual case according to the man and circumstances. My own long experience as a retailer in dealing with contractors confirms the belief that it is within the power of the dealers in a town to eliminate the incompetent and dishonest contractor and it should be their policy to do this. They can do it by tying up with the competent and reliable contractor and giving him such inducements as will make it an object for him to do all his trading with them. I think every such contractor should have a small discount on the prices of the materials he gets, outside of that which he contracts for in figured bills, but this only with the understanding that he must pay his bills promptly. In the case of a non-competitive bill which he has helped the dealer to secure, he should receive a liberal discount, not only for his influence, but also as an inducement to get more of such bills for the yard. In this way, there will be fewer contractors in a town and more reliable ones both for the community and the dealer.

Price to Be Charged to Day-working Carpenters

The day-working carpenters and other mechanics who take small jobs when work is not plentiful, should be charged the same prices as anybody else. It is a mistaken policy to give these men a "rake off" because almost every carpenter becomes at times a contractor, and in order to get work will oblige the better class of contractors to compete with prices that are too low for the work. As a consequence the town will have a lot of men fighting to get business without profit either to them or to the dealers.

I firmly believe it is far better for the dealers in the average country town to deal with two or three reliable contractors than to encourage every "wood butcher" to figure on jobs for which they are not competent to make a correct estimate. If there are but two dealers in the place, one contractor is enough for each, and this will not affect the natural share of the business that will go to each year. It is a common weakness of lumber dealers to allow themselves to be controlled by a local situation that is made by others, instead of creating one by their own action and having it under their control.

All Should Work Together on a Good Basis

Understand me, however, I am not advocating this in the sense of a monopoly for the purpose of getting high prices, but rather with the object of having the business and the building trades working together on a better basis. As it is now in the average town, the dealers are practically under the dictation of the men who put up the buildings, and who force upon the lumbermen an injurious competition that is detrimental to both, and of doubtful benefit to the community.

Why Mechanic's Liens Are Filed

The privilege of filing a mechanic's lien to secure the payment for materials furnished, is an advantage enjoyed by dealers but denied to retailers in other lines of business. Strange to say, however, there are many who do not avail themselves of it as much as they should, and do so only in cases where they are compelled to. Rarely is it done as a precaution, but more often from necessity. The average dealer hesitates to file a lien against anyone, but more especially does he dislike to file one on a job in which a contractor is interested because he knows very well that such action will incur enmity and loss of that contractor's business. The contractor may be a friend of his, and ordinarily is fairly prompt in paying his bills. But in this case he may have made a mistake in his estimate and there is not enough coming to pay out on the material, but he hates to have the lumberman file a lien because it will forever after injure his reputation in securing contracts, and his preference is to have the dealer carry him until he can make up the difference from the profits on future jobs.

Dealer Takes a Risk In Not Filing a Lien

It is natural for us to follow the line of least resistance, but if it is done in business matters it more often results in our suffering a loss, and so in this case, refraining from filing a lien because of these reasons, the dealer takes a risk that is pregnant with the liability of losing the account. Both this and the rupture of friendly relations may be avoided by having a positive understanding with the contractor that whenever the dealer deems it necessary, he will use his lien privilege in any and all cases without prejudice on the part of the contractor. Then he will know what to expect when he contracts for a job.

It is always better to have your misunderstandings beforehand; it saves a lot of trouble. With the purpose of filing a lien if necessary, it is very essential that the dealer keep a close track on where the material goes that a contractor uses on building jobs. It often happens that he has two or more such jobs going on at the same time, and either thoughtlessly or by design, material may be taken from a job for use somewhere else on a repair job, or a mistake may be made at the office in sending it out, or a wrong delivery made and charged up without discovering it at the time.

Receipt for Every Delivery of Material

Another precaution, too, it is well to take. Every delivery should be checked and receipted for by the contractor or some one on the job. This, of course, is unnecessary advice to a dealer who does this, but there are many places where it is not done. In some places there are such free and easy relations between the dealer and contractor that he feels free to go in the yard and help him-

self to whatever he wants, and report it afterward—if his memory doesn't fail him. Most dealers nowadays have a ticket machine, and everything is recorded on it; but not all yards have this, and a good deal of material goes out of the yard and it is taken for granted that it goes on a certain job.

Points to Know in Regard to Deliveries

As a matter of good business, no material should go out of the yard on a sale without being receipted for. This will prevent disputes in the settling of accounts. It is not hard to do after you have acquired the habit and trained your customers to do it. While speaking of this matter of delivery, I want to mention something that is not generally known. It might sometimes happen that after you have delivered some material at a residence, to be paid for on arrival, and no one was there, you learn that the purchaser is a poor credit; you see the lumber lying there and not being used and it's natural for you to feel like sending your team and hauling it back to the yard.

Now, as a matter of fact, you cannot lawfully do this. The lumber you delivered is the property of the man on whose lot it was placed and he could arrest you for taking it if he chose to, and only by due process of law can you recover. You may never have occasion to experience anything of the kind, but it is well to know these little points in the matter of delivering building material.

Some Queer Experiences

In my dealings with contractors I have had some queer experiences. We never know what a man really is until we have had a series of business relations with him, and so I've been surprised when a contractor of good character and repute has asked me, when making out a statement of cost for the material in a job, also to make out a duplicate of the same items, but with a higher price attached to each one for the purpose of showing the owner when he rendered his bill what the material had cost him.

This was a "slick" way of getting a "rake off" on the owner in addition to his charges for the labor and the contractor's discount I gave him. More than one contractor has asked me to do this, but I have always refused, even when told that other dealers were doing it for them. I don't believe in that way of doing business; it's a little mite out of a straight line. I have had real estate men who were agents for property owners, make similar requests for a little bit of "graft" on the material they were buying for repairs on buildings that they had in charge. It is not right, neither is it safe, to do anything of the kind.

The Owner Wants to Know What the Contractor Is Paying for His Material

I presume most every dealer has had the experience of having the owner of a new building who has let the contract to a builder come and want to know what the contractor is paying for the material. His reason for this is obvious, though he may keep it to himself. Some men are never satisfied, even after they have made the contract. If a dealer expects a contractor to be loyal to his interests in a legitimate way he in turn should be loyal to the contractor. When he sells a bill to him it is a private business matter between them, and no business of the owner of the property or anyone else. If you are dealing with the owner direct and selling him the bill that is another matter, and the builder who contracts to do the work has no right to the knowledge of what the owner is paying. Although in such cases the contractor often tries to find out so he can see whether the dealer is selling the owner at lower prices than he charges him. I have never seen a contractor yet who didn't think that he ought to buy material cheaper than those who were not in the building business. He expects this of the lumberman and believes it is right that he should. This feeling makes it awkward sometimes for the dealer who has been obliged to sell a bill at a low margin of profit because of the close competition of other dealers. The bill perhaps has been peddled around in neighboring towns for this purpose, and likely as not, has been sold to the customer at lower figures than the dealer had quoted the contractor, consequently he is interested in keeping him from knowing this fact.

Difficulties of the Country Dealer

This is a difficulty that every country yard dealer has to contend with in trying to make the contractor a preferred customer because in a country yard business a good proportion of the bills are sold direct to the property owner, and he usually puts his bill up for competition and is sold by the lowest bidder. The average person going to build would strongly resent the idea that he could not buy lumber as cheap as the contractor could, and some contractors are leaky enough to give it out that they can do better with the dealer in this respect than the party going to build can, and it will make the dealer squirm if the question is put up to him by either of the two parties for confirmation. This is one reason why it is so hard to line up with a contractor and keep him from getting figures at competing yards.

A Rarity Among Small Contractors

I believe it is the experience of most dealers that the small contractor who always pays his bills promptly is a rarity—at least the writer has found it so. But it is only fair to say that it is not always the fault of the contractor. The average contractor is not so good a judge of credits in the town as the lumberman is, and therefore he often takes jobs from parties whom the dealer would not care to trust, and this is why he gets such jobs. The result is that the carpenter-jobber cannot pay his lumber bill because people for whom he has done a job don't pay him.

The remedy for this is, when the dealer knows that his carpenter customer has contracted to do

a job for a man who is poor pay he should tell the carpenter to collect the money for the material before commencing the job. It's surprising how people will expect a small jobbing carpenter to furnish the material and do a job for them and then expect to pay for it at their convenience. But, as we know, it's not the carpenter who carries them. It comes back on the dealer who sold the material.

In cases of this kind where the contracting carpenters are regular customers, I think it good policy for a dealer to give them assistance in making their collections. The ordinary jobbing workman is a poor collector. He may get enough out of a job to pay for labor, but he is weak on getting the balance which represents the cost of the materials, and he is averse to pushing very hard for a settlement for fear of losing his customer. If he is honest he can have no reasonable objection to having the dealer take over his account and collect it. There is always the probability of this class of accounts being eventually paid a little at a time to the jobber who will be in need of the money and use it for his own personal requirements, and so, in the last analysis, the dealer "holds the sack" until such time as the carpenters can pay him.

The Open Season for Houses

"We couldn't afford to buy a car this year as we had intended," said the Renter, "and so we told a lot of builders we were in the market for a house. Now nearly every pleasant afternoon you will find us out automobile riding, or house-hunting, if you prefer to call it that.

"House-hunting is the American city-dweller's favorite outdoor sport. The open season is from January 2 to December 31, but most of the hunting is done in the Spring and Summer months.

"There are two kinds of houses, the tame and the wild. The tame ones are those erected for sale by contractors, real estate men, builders and other optimistic persons. Some of the tame ones sometimes have a wild appearance, but that is due entirely to the architect and not to any inherent insanity in the material employed. The true tame variety is, or are, readily approached and are, or is, not difficult to capture. They can be brought down with very small shot, as far as payment is concerned.

"The wild houses are those now for sale, but occupied at present by tenants. Of course, the houses themselves are not wild, but the tenants very often are. After a builder or real estate agent has succeeded a few times in inducing a tenant to admit a house-hunter, he is fully trained and ready for the diplomatic service.

"As to house-hunters, the female of the species is more deadly than the male. The man house-hunter, when poking around somebody else's premises, feels as much at home as a burglar, or a man visiting his wife's relations, or a fellow in a Palm Beach suit at a full-dress dinner. He is constantly afraid that in one of these closets some time he is going to bump into the well-known family skeleton or learn something that the tenant might not like to have him know.

"His wife, on the other hand, is afraid she won't. As a matter of fact, there are very few skeletons in family closets any more. They are too small. In consequence the family skeleton has to be kept on the front porch, or in some cafe downtown, or in some other quiet and secluded spot that is about as private as a town pump.

The Information a Woman Can Obtain

"A woman can go out, in one afternoon, get a pretty good idea not only of the houses in a neighborhood, but also of the house-keepers. She may not observe whether the dining-room opens into the living-room or the hall, but if the breakfast dishes aren't washed she will be sure to notice it. That is why the tenant loves the house-hunters and meets them at the station with a band.

"The man house-hunter, after he has looked at three houses, isn't quite sure whether it was the one with the library and no laundry that was $8,500 and where they wanted $200 down, or whether it was the one with the Queen Anne front and the railroad yards at the back.

"A woman will poke around in a house like a small boy and a yellow dog digging out a chipmunk, but a man's observation is as superficial as cheap paint. A man will come away with mighty few ideas concerning anything, but give a woman house-hunter access to the premises and she will come out with a lot of new ideas for making over her yellow organdie or blue poplin, estimates of other people's probable income, whether the children are healthy and properly raised, and certain knowledge as to whether the folks are living a cat and dog life. The information a woman can pick up on a house-hunting expedition is remarkable and would surprise most of the people it most concerns.

How to Make People Happy

"And one fine thing about it is that there is nothing like house-hunting to make people contented and happy. It may be a little irritating at the time, for the tenant anyway, but after you get home and walk into your own living-room with the hospitable fireplace in it, and the davenport facing it, and the book-cases along the wall, and hang your hat in the big closet with the window in it, and sit down in the oak and linen and glass dining-room and drink a little lemonade from the built-in refrigerator in the kitchen, you are so pleased and satisfied and altogether content with what you have that you don't even think of moving for another week.

"So, you see, we are having a rather enjoyable summer, without much expense; and there seem to be enough houses, and enough builders and real estate men of from one to six cylinders, to keep us entertained and busy until fall. Why buy a car and give up house-keeping for up-keeping, or why fight mosquitoes at a cottage or a clerk at some hotel, when there are so many pretty suburbs in your own vicinity that you have never visited?"



An Up-to-date Lumber Yard in Iowa

Some Interesting Particulars Relating to the Business of an Enterprising Lumber Dealer in the Central West

WHEN Charles Lyon bought a piece of property in Fairfield, Iowa, and announced that a lumber yard was to be located there, the residents in the neighborhood of his site were so concerned as to make a protest to the City Council. Several meetings were held to prevent the building of the yard, but when the nature of the proposed structure was explained to the opposition their objection was withdrawn.

Two fine large elms stood at the front of the property, and so the building was set 8 ft. from the sidewalk in order to save the trees and to add their beauty to the place. And the yard that was built is one of the best in Iowa.

The location is right in the residence district, and only about a block from the public square. The building is a handsome one, measuring 102 by 120 ft. in plan, and painted white. It is designed with the office in the center and a driveway and shed on each side.

The office trim is of several different kinds of wood in natural finish, so that the grain or figure may be seen. It was purposely arranged in this way so as to show home owners and others how these woods appear when finished.

Upstairs there are four fairly large rooms, and each has a different trim and finish from the others. One has a mahogany finish, one a white enamel, another is in golden oak, etc. The walls are all of beaver board. The largest front room is intended for a rest and reading room for customers and the other front room is a drafting room. The two rear rooms serve as bedrooms for Mr. Lyon and his foreman, who live at the yard.



Interior View of Shed Showing Method of Keeping Stock



Another View of the Interior of the Shed

In the sheds the same careful planning is evident. The lumber is carefully stacked, and at the end of each section is a placard telling what the contents are and the various sizes, giving also, in plain figures, the price of each material by the piece and in larger quantities. Molding and interior finish are stood on end and placed in the center of the shed, so that all sizes are easily reached from either driveway. All stock is under cover.

This yard has an agency for Wheeler's screens, and uses Ye Planry plans. It does not handle brick or tile, nor builders' hardware, nor paints, except roofing paints. It does handle Louden's barn equipment and the Milwaukee Corrugating Co.'s metal products.

A piece of property next to the building on the west is vacant, and Mr. Lyon has a garden there. That part next to the sidewalk is planted in tomatoes, and the vines are attached to 7-ft. creosoted stakes. As this is not the usual method of growing tomatoes, it at first excited a great deal of interest, and the interest was heightened by a sign on one of the stakes, "Tomato Stakes for Sale."

This is only one evidence of a wide-awake policy followed by Mr. Lyon to keep his yard before the townspeople. He uses to good advantage the advertising material furnished by the Cement Association, the Reckitt Corporation, and others, and prepares it carefully for his own uses before mailing to a selected and up-to-date list of patrons and prospects. He uses colored slides furnished him by the various manufacturers whose goods he handles, displaying them in the theaters. On Sept. 8, by arrangement with a picture house, he had a film run as a part of the regular program. He sent out on his letterhead notices of the event, to reach his list two days prior to the date of displaying the picture, enclosing a free admission ticket, and offering to supply more on request. The results of this plan were beyond expectation in responses.

All of this publicity has its effect, and the Lyon yard is a busy place. For hauling, a Chalmers touring car converted into a truck is used, with a four-wheel trailer, and Mr. Lyon considers this equipment much more profitable, from a service standpoint, than his horse-drawn delivery.

Every indication bespeaks the businesslike spirit of the place, giving interest to employees and establishing in the visitor admiration and confidence.

As Seen by the Man on the Roof

Only the Best Will Do

You may be able to skimp the job,
With less than they guess get by;
With poorer paint or a cheaper knob,
Or something somewhere shy.
It doesn't pay, in the long, long run,
The owner, the builder, you.
A good day's work is a good job done
When only the best will do.

It isn't only the brick you use,
The board, or the gray cement;
It isn't only the nails, the screws—
It's how at your work you went.
It's whether loving your work, or not,
You loaf, or you put it through—
For mind, or muscle, or arm, or what,
Then only the best will do.

It isn't only the job in hand
That matters, and only now.
For life's a job, as you understand;
Are you doing it well, or how?
A voice will ask and an eye inspect;
Then how will it be with you
As you stand before life's Architect
When only the best will do?

Cal, the Carpenter, Says:

There is only one way to rub a cat, or a customer.

Trouble is like a knot: See that you saw it through.

A half-done job is about as useful as a half-bored hole.

An optimist is a man who uses a worm-hole to hold a nail.

Hot weather gets a horse all in a lather, and a lather all in.

Many a man would do a better job if he didn't know about putty.

Come through with your work, unless it is nailing interior finish.

The more bum joints you hang around the more of them you will make.

Trouble is often the sandpaper of life smoothing the path of the future.

A lot of fellows fail in life because they have plans but no specifications.

There is an exception to every rule, and I take one to somebody else using mine.

You can't do a straight job of living with a crooked miter-box of principles.

The time to quit driving a screw is when it will hold, not when it will do.

Some fellows can split enough wood on one job to run a cook stove all winter.

The time to think about is not how long it will take but how long it will last.

A reform movement is like a carpenter job: There is a lot of help that only gets in the way.

I have spent a lot of time in life patching up the jobs of fellows who saved theirs.

You can smell shellac on many a man who says he is giving you the plain unvarnished truth.

An argument is like a nail: If you want to clinch it, look at it from the other fellow's side.

The world is still some distance from the time when it won't be necessary to put a lock on the door.

Apparently the American people this summer not only raised everything they had to eat but also everything they had to sell.

The cost of building has advanced tremendously in the last twenty years. Probably the first man kicked about it, too, after he had moved from a cave to a cabin.

Why Some People are Plumb Crazy

A great hole had been torn in the side of the householder's house, and the kitchen floor was covered with fallen plaster, splintered lath and other debris.

"Cyclone?" asked the visitor.

"Nope—plumber."

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

The "Topping" Garage Door Hanger

Among the more recent candidates for popular favor in the way of garage door hardware is the hanger which has been placed on the market by the Safety Door Hanger Company, Ashland, Ohio, and a general view of which is presented in Fig. 1. It is known as the "Topping," and its construction is so clearly indicated in the picture that comparatively little description would seem to be necessary in order to render it readily understood. It is built to stand the wear and tear to which the average garage door hanger is likely to be subjected, has few parts and is easily and quickly applied. It is provided with an adjustment feature which takes care of any sag in the doors, and has latch and chain for automatic holder. The point is made that when the door is open it folds outward, taking up no valuable space inside the garage, neither does it require long guides in the floor. When the door is open, it is said to remain in that position without any attention on the part of the operator, and when closed it automatically snaps itself tightly shut. Another point to which the makers call attention is that the hanger allows the use of the full door opening without risk of damage to the car or to the door. This hanger is said to represent the result of years of effort to reach a solution of the garage door hanger trouble.

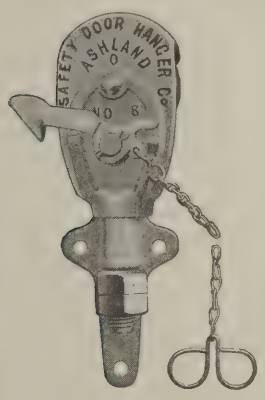


Fig. 1—The "Topping" Garage Door Hanger

Concreting in Cold Weather

The subject of concreting in cold weather is one which has received a great deal of attention in the recent past, and the importance of the precautions necessary to safeguard the work carried on during freezing temperatures has caused the Portland Cement Association, 111 West Washington Street, Chicago, Ill., to issue a sixteen-page pamphlet profusely illustrated and telling how to properly carry on work of this nature during the prevalence of low temperatures. Copies may be obtained by any interested reader on application to the address given. In this connection it may not be out of place to mention the fact that a short time ago we presented in these columns a number of things to be remembered by the builder when doing concrete work in the winter months.

"Hudson" Shingles as a Roof Covering

In many sections of the country buildings covered with roofs laid to produce the thatched effect are very popular and examples of this sort of treatment are to be found in increasing numbers. A striking instance of this kind is found in the residence of Samuel F. Pryor, at Greenwich, Conn., the roof of the residence and also of the lodge being covered with Hudson shingles laid with the thatched effect, and made by the Asphalt Ready Roofing Company, 9 Church Street, New York City. They were specified by Architects Cross & Cross of New York, and the shingles were made especially to order for this job. They consisted of the company's red and green mottled shingles, green shingles, brown shingles and brown and green mottled shingles, the arrangement being such as to produce a very pleasing effect. These shingles were laid 3 in. to the weather in some instances and each shingle was cut so as to give the roof a very artistic design. A portion of the lodge roof is shown in Fig. 2. The company points out that laying a roof of this kind can be called "careful carelessness." We learn from the Asphalt Ready Roofing Company that its Hudson shingles



Fig. 2—Gate Lodge of S. F. Pryor Roofed with Hudson Shingles So Laid As to Give the Thatched Effect

are about to be used on the residence of F. W. Frost, at Plainfield, N. J., the architect being John P. Benson of New York City. A large quantity of the shingles were used on the workingmen's houses being erected for the American Brass Company, the Scovill Mfg. Company and the Oakville Company at Waterbury, Conn. The shingles were also used on the Riverdale country school of Riverdale, N. Y., designed by McKim, Mead & White, the well known New York architects.

Winter Plans for Summer Building

When the wind whistles around the chimney and the glowing fireplace invites us to spend our evenings at home many of us are beginning to plan for improvements, additions and new buildings to start in the early spring. More and more there is a tendency to build better. The great losses by fire that constantly occur in this country are coming to be regarded as almost criminal. The great majority of waste through destruction by fire is absolutely unnecessary if proper precautions are taken to prevent the spread of flames. The home builders in the past have seemed to regard the matter of protection from fire as applying only to business buildings or large structures. As a matter of fact, it is just exactly as important that homes be properly constructed if we are going to prevent such conflagrations as we have witnessed in a great number of our important cities.

The use of inflammable roofing should not be permitted. Fire-resisting metal shingles are economical, durable and attractive in appearance. It is now possible to have the framework of the houses of metal lumber which takes the place of wood studs and joists piece for piece. It is easily erected, and gives a substantial fire-resisting construction, adding greatly to the value of the building to the owner and to the community. This metal lumber construction has been used in practically every State of the Union and in many foreign countries, and has proved a very practical construction. Expanded metal lath for years has been used in the larger buildings and is now being used in a large number of the better built homes. This lath not only offers no food for flames, but it reinforces the plaster in such a way that cracks are prevented, thus making it possible to decorate immediately after the plaster is dry. It also prevents rats and mice from gnawing through the walls, thus giving sanitary protection as well as fire protection. Even where the ordinary wood studs and joists are used for the framework of the home the application of expanded metal lath will greatly reduce the fire risk, as plaster on metal lath will resist intense heat, as has been proven by official tests made where plaster on metal lath applied on wood studs resisted a fire of 1700 deg. for a period of over an hour without any sign of giving way. This means that a fire starting in any room can be held in that room sufficiently long to get it under control before it spreads to other parts of the building.

Something About Lastbestos Roofing Slates

The interest that has been rapidly growing in fireproof construction and in means of preventing the spread of fire, has caused manufacturers of roof coverings to give the matter serious consideration, and one of the results growing out of the demand for a fireproof shingle is what is known as "Lastbestos Roofing Slates" as made by the Trus-Con Laboratories of Detroit, Mich. These slates are manufactured from Portland cement and asbestos, the materials being combined under such great pressure as to produce practically a new material—an asbestos cement—which embodies the excellent qualities of both substances. The combination of asbestos with the cement is so effected as to give a finished product that is said to be fire-resistant and in addition are weather-proof and time-proof. At the same time they are of a minimum weight, and are characterized by very low conductivity. This property, it is claimed, provides greater comfort in rooms located directly under the roof. In other words, the rooms are cooler in summer and warmer in winter than would otherwise be the case. In Fig. 7 of the illustrations, we show a section of a roof area with several courses of the shingles in place and clearly indicating the method of procedure. In Fig. 8 we show the top or ridge of a building covered by a ridge board of convenient dimensions in order to allow the inside of the ridge roll to rest firmly on it and fit tightly to the finished roof. The small ridge roll clips, one of which is shown in the illustrations, are fastened to the ridge board, one being nailed at the extreme end. The large end of the ridge roll is placed against this clip and the clip bent over the top of the roll. The small end is nailed to the ridge board by nailing through the clip and the ridge roll. The large end of the next roll is then placed tightly against the clip and is fastened by bending over the roll. The remaining ridge rolls are fastened the same way, care being taken to keep them tight with the finished roof. The manufacturers state that the slates weigh about 420 lb. per square of finished roof which requires 260 shingles. The company has issued a four-page folder illustrating the Lastbestos slates and showing how they are applied to a roof. A copy can be obtained by any reader by addressing the Trus-Con Laboratories.

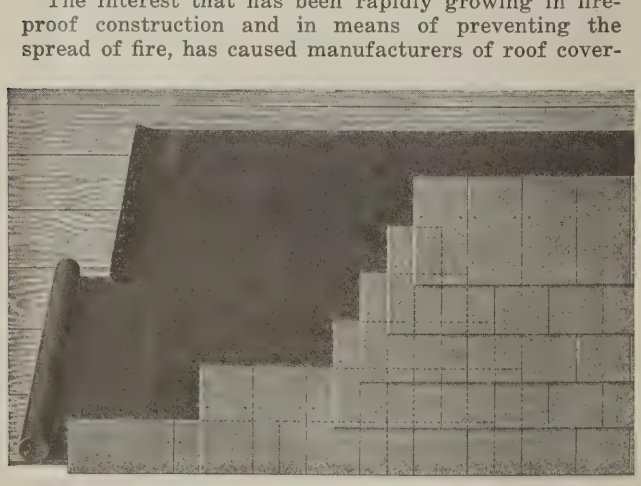


Fig. 3—Showing the Method of Laying "Lastbestos" Roofing Slates

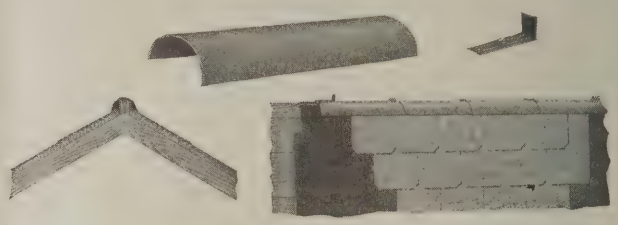


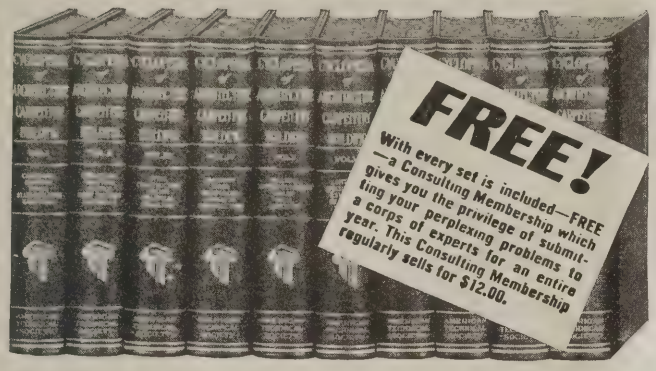
Fig. 4—Method of Finishing the Ridge

Excelsior Soft Coal Warm Air Furnace

"Comfort should be the main feature of every home and everything else should be subservient thereto" is the opening sentence in an attractive pamphlet which has just been issued from the press by the Excelsior Steel Furnace Company, 114 to 118 South Clinton Street, Canal Station, Chicago, Ill., and which illustrates and describes the Excelsior soft coal, down draft, warm air furnace. Reference is made to the fact that "health and comfort depend upon the proper temperature of the home and to secure it an ample supply of pure, fresh, warm air is essential. This may be obtained by the installation of an adequate warm air heating system" and the claim is made that this is accomplished by means of the "Excelsior" heater made by the company. Among the early pages the various methods of heating with which house owners are familiar are described, as are also various methods of burning fuel. What down draft means and does are elucidated and full directions are given of the operation and construction of the heater in question. The entire matter is presented in a way to appeal to the builder and the house owner and we understand that a copy of the catalog will be sent to any reader of THE BUILDING AGE who may desire it.

(*Continued on page 22 of the advertising section*)

Order Books Before Advance in Price!



Send Coupon--Save 50%

The rapid increase in the cost of paper, binding materials, labor, etc., means that we will soon be forced to advance the price of this great Building Library. Rush the Coupon today and save 50%.

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On Architecture, Carpentry and Building

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The Library covers the entire subject from the cottage of wood to the city skyscraper of steel or reinforced concrete; from the first rough sketch to the finished plans and from the awarding of the contract to the turning over of the completed structure to the owner. Actual problems in construction are presented and worked out in detail. Many photographs of buildings in various stages of construction are given, adding to the clearness, practical value and interest of the work.

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Books Sent 7 Days *Free!*

Entire 10 volumes shipped prepaid, right to your own home. If you decide not to keep them, send them back to us within seven days.

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Chicago, Illinois, U. S. A.

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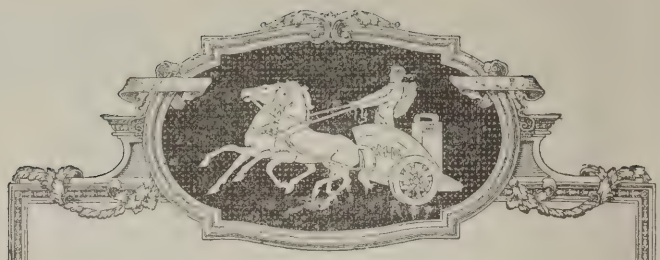
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Please send Cyclopedia of Architecture, Carpentry and Building for seven days' examination. I will send $2.00 within seven days and $2.00 a month until I have paid $24.80, or notify you and hold the books subject to your order. Title not to pass until fully paid.

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Lasting Newness

Of course you turn every building you construct over to architect and owner spic and span and you want it to remain in that condition. If you see that your painters use Murphy Varnish, you can always feel sure that you have given your work a finish that will "stand up" for the longest possible time no matter what treatment it receives after it leaves your supervision.

Murphy Varnish

"the varnish that lasts longest"

Architects and owners may sometimes seem indifferent as to what varnish you make your painters use. But no one can be indifferent to the service that Murphy Varnish gives and the beauty of the finish that it produces.

Our country-wide advertising is constantly familiarizing everyone with the facts about varnish—the plain *unvarnished* facts. Builders who do high grade work are sure to benefit from it.

Send for further information about our many products.

Murphy Varnish Company

Franklin H. Murphy, Jr., President

Newark Chicago

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A

(Continued from page 666 of the editorial section)

The Oliver Saw Guard

A guard which is suitable for almost any saw of any make has just been brought out by the Oliver Machinery Company, Grand Rapids, Mich., and an illustration of which is presented in Fig. 5. The device is of such a nature that the location of it is optional with the operator as the shaft over which it slides is square, thus allowing the wooden guard to be located in the precise spot above the saw most convenient to the operator. The shaft upon which the saw guard and counterbalance are hung is provided with collars between which are placed friction washers regulated by a nut on the end. This allows the guard to be set at any positive height from the table and held securely in this one position or by loosening

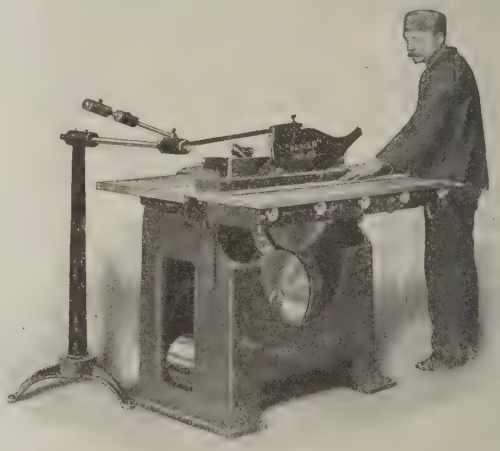


Fig. 5—Showing the "Oliver" Saw Guard in Use on a Machine and the Position of the Operator

the nut and adjusting the counterbalance, the guard may revert to the table itself after every piece has been passed beneath it. These various adjustments make the guard almost universal in its application and one that will readily suit the ideas of the individual operator. The location of the tripod holding or governing the guard is entirely optional on account of the length of shaft which goes through the body. In the illustration the guard is shown in connection with an Oliver saw bench and clearly indicates the position of the operator of the machine.

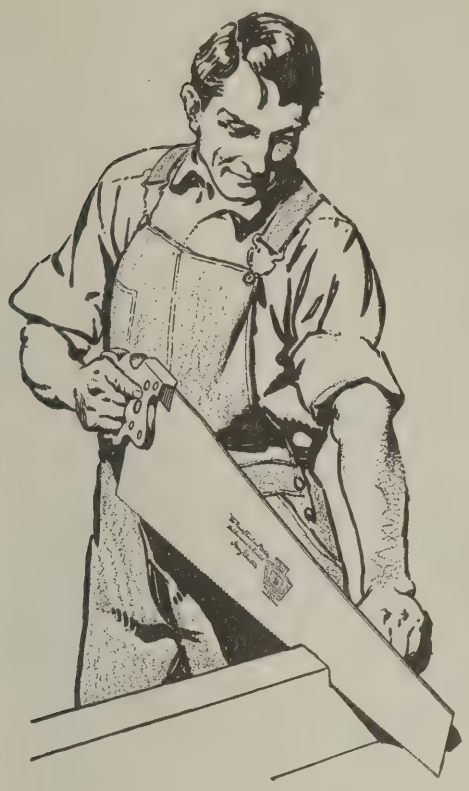
How Prepared Roofing and Asphalt Shingles Are Made

Under the above title there has just been issued from the press a most interesting pamphlet of 44 pages making special reference to the economic advantages of prepared roofing and asphalt shingles, and also presenting data relating to roofing ordinances in various parts of the country. The subject is one in which our readers cannot fail to be deeply interested, and we take pleasure in reproducing a short chapter telling how prepared roofing and asphalt shingles are made.

"Asphalt shingles and prepared roofings exist as the result of a scientific selection of raw materials and processes of manufacture. Each component part is chosen because of its peculiar qualities which enable it to assist in the building up of a finished product, capable of meeting all the demands ordinarily placed upon a roof covering.

"In general asphalt roofings are made by saturating a sheet of tough fibrous felt with waterproofing asphalts or other bitumens. The felt is then sealed with a weather-defying coating, into which is often embedded a mineral surfacing which adds to its life as well as to the texture and beauty of the finished material. Pre-

(Continued on page 24)



Most of You Mechanics Use

DISSTON
SAWS AND TOOLS

Do You?

Ask any hardware dealer what saw the mechanic prefers and the chances are he'll tell you the **Disston.** Most mechanics **do** use the Disston—a recent investigation again proved that fact.

The endorsement of the majority of skilled artisans, men whose livelihood depends on tools, ought to be a pretty safe guide.

The chances are more than even that you use the Disston now; but if you don't, try them next time.

HENRY DISSTON & SONS, Inc.
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Try This Aloe Level 10 DAYS—FREE

Easy Monthly Payments If You Buy

Prove the superior quality of the Aloe Convertible Level by testing it out for 10 days. Use it on your every day work laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting walls, piers, etc., for getting angles, or levels anywhere and the hundred and one other things for which you would use a level or transit. Then, if you decide to keep it, you may pay for it in easy monthly payments so small that you will scarcely feel them.

Aloe Convertible Level

is more than a mere level. It is a modified transit permitting double the range of work possible with an ordinary architect's level. Its construction is such that sights above or below the horizontal can be taken, making it the finest instrument ever offered at anywhere near the price. For taking vertical sights the instrument is provided with a special convertible bracket rigidly and permanently attached to the cross-bar thus eliminating the extra time that other instruments require for changing the telescope in position to take vertical readings. The telescope which is fitted with a permanent axis, rests in the bracket bearings and owing to our special constructed clips the instrument can be used for leveling while in this position if desired, although the bracket clips are easily and quickly released from the telescope axis when levels only are to be taken. The telescope is then set in its normal position in the wyes and you have overcome the old method of attaching and detaching the convertible bracket.

Your Own Time To Pay—No Interest

Remember, you are under no obligation whatever to keep the Aloe Convertible Level. We do not even ask you to promise to buy. But you owe it to yourself to see and try it. If it isn't all you expect you may return it at our expense. If you do keep it, you will find the small monthly payments easier than paying rent for an instrument—and at the end of a few months you will own it—absolutely. There's no red tape about this offer—we ask no embarrassing questions—everything is confidential—we charge no interest. You have practically your own time to pay.

Mail Coupon for Descriptive Circular

It explains the Aloe Convertible Level in detail and shows how easily the man without the training of the engineer or surveyor may secure the same accurate results as the expert. Send your name on coupon or postal for free copy and full particulars of our original, unique and popular selling plan.

A. S. ALOE CO., 625 Olive St., St. Louis, Mo.

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Please send free descriptive circular about the Aloe Convertible Level and complete details of your easy payment plan. This request in no way obligates me.

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Plate F-271-FA

The "Bevo" Built-in Lavatory

The New Product in

KOHLER WARE

Always of one quality—the highest

Here is a new pattern that you have been waiting for — a built-in lavatory that is a companion piece to the "Viceroy," America's foremost built-in-bath.

This new design builds into the wall of the bathroom and is of unsurpassed quality and beauty. The unbroken artistic lines please the eye. The KOHLER pure white enamel makes it easily cleaned. With the widely known KOHLER "Viceroy" bath, the original *one-piece* built-in bath, it offers an ideal bathroom combination.

"Bevo" Lavatories may be had with or without the pedestal.

Your customers will appreciate the "Bevo."

Our new book, "KOHLER OF KOHLER," illustrates and describes this new fixture. A postal will bring it to you.

KOHLER CO. *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Pittsburgh Detroit
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San Francisco Los Angeles Seattle London

pared roofings are sold in sheets, usually 32 or 36 in. in width and put up in rolls containing one square, which means enough material to cover 100 sq. ft. of roof surface. Cement for the seams or laps, nails and other accessories are packed in the core of each roll, together with the necessary directions for laying.

"Asphalt shingles are cut from the roll roofing and are sold without accessories in crates, cartons or bundles. The price quoted is always for enough shingles to cover one square of roof surface (100 sq. ft.) when laid according to the directions accompanying each shipment.

"The felt base must have unusually high absorbent qualities so as to take up and retain a maximum amount of waterproofing saturation. It is not necessary that a large percentage of wool be contained in this felt; in fact a more absorbent, stronger, and better suited felt can be secured with but few wool fibers present. Once thoroughly impregnated with the asphaltic saturating compounds the felt is permanently protected against moisture and decay.

"The real life of prepared roofing depends upon the saturating and coating compounds. In other words, the roofing will be waterproof and afford protection as long as these saturating pitches or asphalts remain in the felt. Their only means of escaping is by evaporation, and because volatile matter is present in such small proportions the destructive attacks of the sun are rendered practically non-effective. The saturated and coated felt which makes up the finished sheet sheds water and does not absorb moisture, therefore constant wetting and drying has no effect upon it. This holds true whether the roofing is used in roll or shingle form."

Attention is given in the booklet to economic facts in regard to the industry, and maps of the United States are interpolated showing in one case the sections producing wooden shingles and in another case the location of factories of manufacturers of prepared roofing. There are also given a number of roofing ordinances, together with data relating to fire tests showing the fire resisting qualities of asphalt shingles. The latter, it is interesting to state, are approved by the Underwriters' Laboratories and are recognized as fire-safe and accepted for use in New York City. The pamphlet concludes with a number of vital questions answered in regard to asphalt shingles and prepared roofing. A copy of it can be obtained from the Prepared Roofing and Shingle Manufacturers' Association, Chicago, Ill.

Ideal Cincinnatus Concrete Batch Mixers

A catalog illustrating and describing Cincinnatus mixers for general contracting purposes, and which is said to cover the complete line for 1918 which the company is offering to the trade, is being distributed by the Ideal Concrete Machinery Company, Cincinnati, Ohio. The first eight pages are given up to a description in detail of the design and workmanship entering into the manufacture of each part of the mixer so that the construction and operation of the mixing drum, loading skip, automatic water tank, hoist shaft, trunnions and trunnion bearings, the discharge action, engine, etc., can be readily understood. The rest of the catalog is devoted to illustrating and describing the various types of concrete mixers manufactured by the company, a brief specification of each style being given. The last two pages of the catalog are devoted to prices of the mixers, together with a brief specification.

Building in the Winter Months

Much has appeared in the trade press in the recent past in regard to the carrying on of building operations in the winter months and various have been the suggestions offered as to the way in which the work can

(*Continued on page* 26)

NEW Buildings from OLD Ones

Keep busy all winter. Old frame buildings can be transformed into beautiful, modern, enduring buildings for a fraction of the cost of new lumber by





Overcoating with KELLASTONE

IMPERISHABLE STUCCO

Solves the high-cost-of-materials problem. Can be applied in zero weather. Cannot freeze because not mixed with water. Bonds perfectly with any wood, brick, concrete or tile. Write for booklet.

Fireproof, waterproof, coldproof, Heatproof, strainproof, crackproof

NATIONAL KELLASTONE CO.
1317 Mallers Building, CHICAGO

Kellastone Composition Flooring
is Sanitary and Seamless



Carborundum Sharpening Stones Keep Edge Tools on the Job

WHEN a chisel, a gouge, or a plane bit begins to lose its edge—fails to cut true and clean—you needn't lose much time or spend much effort in putting it back on the job.

Carborundum Sharpening Stones

Bring back the edge in a jiffy—just a few rubs and the tool is right again—fit and ready for the work. There are no sharpening stones that cut so fast and clean—that hold their shape—that last so long.

Ask Your Hardware Dealer

The Carborundum Company, Niagara Falls, N. Y.

New York Chicago Boston Philadelphia Pittsburgh Grand Rapids Cleveland Milwaukee Cincinnati



Fiberlic

Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
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G. & H. Barnett Company
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Owned and Operated by Nicholson File Company

be advantageously conducted. It goes without saying that if a building can be enclosed before cold weather sets in it is a comparatively easy matter to keep the men busy inside doing the finishing so that when spring comes around the structure is ready for the final touches. One method of enclosing the framework of a house which has been suggested is by the use of Bishopric board. Among the advantages pointed out for the use of this material is that in the fall the houses may be closed in and allowed to stand until spring, when the work of applying the stucco can be done. In the meantime the interior work can be completed so that the houses will be ready for occupancy early in the spring season. We understand that a great deal of the board in question is being used in this way and it would seem to offer one solution at least of the problem of conducting building operations in the winter months.

The Fruehauf Semi-Trailers

We have in the recent past called attention to the advantages resulting from the use of motor trucks and trailers to contracting builders, lumber dealers, sheet metal contractors, cornice men, and others having occasion to transport materials and men from the shop to the jobs upon which work is being done. This use is constantly growing by reason of the economies effected and as the benefits are more widely understood. Among the candidates for popular favor in the way of semi-



Fig. 6—A Fruehauf Trailer Loaded with Lath

trailers is that which is being brought to the attention of the trade by the Fruehauf Trailer Company, 1373 Gratiot Avenue, Detroit, Mich., and an illustration of the appearance of which in practical use is presented in Fig. 6. It is a well-known and recognized fact that increased carrying capacity and greater efficiency in loading and unloading, are some of the features introduced by the semi-trailer. With the motor truck and semi-trailer method of delivery, lost time can be almost entirely eliminated by using three semi-trailers to each truck, one being already loaded, another in transit and a third at destination being unloaded. By this method the truck can be in operation every hour for which the chauffeur is being paid to drive it and in keeping the truck in operation, greater efficiency can be derived. The picture which we show in Fig. 6 is a good illustration of what this method of delivery will produce. Here is a 1½ ton G. M. C. motor truck with semi-trailer, having a rated carrying capacity of 6 tons upon which is loaded 8 tons of green lath. The contracting-builder and the lumberman cannot fail to appreciate the economy of such a combination. In using three trailers per truck—loading, delivery and unloading at the same time—it is easy to estimate how this company makes its motor truck and trailer equipment pay for itself in a very short time.

(*Continued on page* 28)



A New Marvel In Sargent Design

A Thin Cutter That Doesn't Chatter

That's what you want in a plane. You can depend on it that the new Sargent Automatic-Set Bench Plane never chatters—not even in the toughest, hardest wood.

The specially designed Clamp, Frog and Bed eliminate all possibility of chattering—combining solidity, compactness and simplicity.

See the six sizes of this plane at your dealer's today, or write for full descriptive catalogue.

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53 WATER STREET NEW HAVEN, CONN.

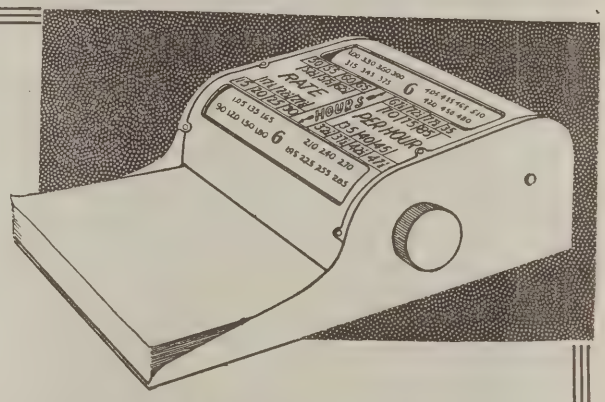
SARGENT

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Whether Your Pay Roll Be Large or Small

If you permit it to be figured mentally you are not only gambling with your money, but wasting the time of one or more valuable employees. It is just as necessary to figure a small pay roll accurately as it is a large one.

You can dispose of your pay roll quickly and accurately, figuring every penny in a few minutes.



RICHMOOR WAGE COMPUTOR

Should be in the hands of every contractor, dealer or manufacturer. It gives you the total of fractional wage hours instantly. Requires no mental effort. No long columns of figures to tire the eyes. Nothing to do but write down the totals as they appear on the dial. Always correct to the penny. Can be carried in your pocket.

Contractors everywhere are using it and speaking well of it.

Guaranteed for a year against defects of any character.

Use Coupon below.

F. D. Bassett Co., 606 So. Dearborn St., Chicago, Ill.

A $5 BILL May Save You Hundreds of Dollars

F. D. Bassett Co., 606 So. Dearborn St., Chicago.

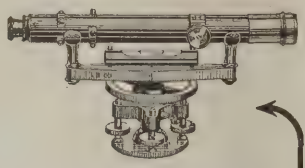
Enclosed find $5.00 for which please send me one Richmoor Wage Computor with the understanding that if after a 10 days' trial it is not satisfactory it may be returned and my money refunded.

Please send me more information regarding Richmoor Wage Computor.

Name .....

Address .....

Accurate Foundations



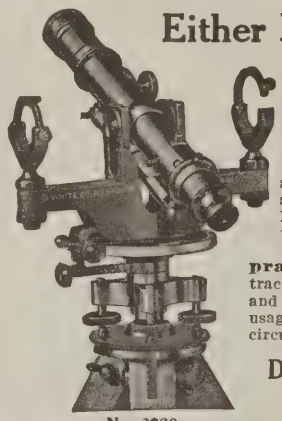
Builders are forsaking old-style foundation methods for the use of scientific instruments that are simple, strong, and absolutely *reliable.*

This Dumpy Level is made by Beckmann of Toledo. Costs you just $42.50. *Ensures modern accuracy.*

Send for the new Beckmann Catalog!

The L. Beckmann Co.

300 Jackson St., Toledo, Ohio



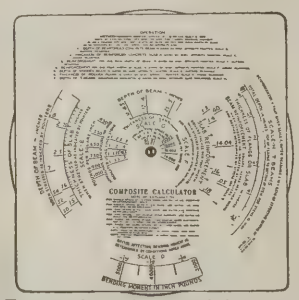
No. 2020

Either Level or Transit—Change in 10 Seconds

Here is a convertible level without any loose parts. You are always instantly ready for either lines or levels. **Change from level to transit in ten seconds.** A thoroughly **dependable** and **practical** level for the practical contractor. Built correctly of best materials and will stand years of hard knocks and usage. **Not high priced.** Send for circular and trial offer.

DAVID WHITE CO., (Inc.)

421 East Water Street
MILWAUKEE, WISCONSIN



SEND A $2 BILL TO-DAY

For this handy

COMPOSITE CALCULATOR

(Complete with Instructions)

For use in designing reinforced concrete slabs, beams and girders. All computations for concrete are based upon the Joint Committee recommendations, using the Straight Line Formula.

Circular with full particulars.

KOLESCH & CO. 138 FULTON ST., NEW YORK



Something For You

in our Pamphlet 29; viz.:

Valuable Tables for finding size of joist, safe load of joist, actual load on hanger, etc., etc.

Some of these Tables are not in print elsewhere.

The Pamphlet and the Mounted Model Hanger will be mailed on request.

SOMETHING FOR US. We ask your special attention to items 5, 6, 7 on page 5 of the Pamphlet and to the matter on pages 23 and 24 relating thereto.

The W. J. Clark Co.

Salem, Ohio, U. S. A.

New Types of "Standard" Snow Guards

While it may be a little early in the season for the house owner and the builder to give serious thought to the matter of snow guards for the roof, he cannot fail to be interested in two new types which have been added to the "Standard" line as made by William Cromley of Lewisburg, Pa. They are known respectively as the "Standard Bar Loop" and the "Standard Corgate," and

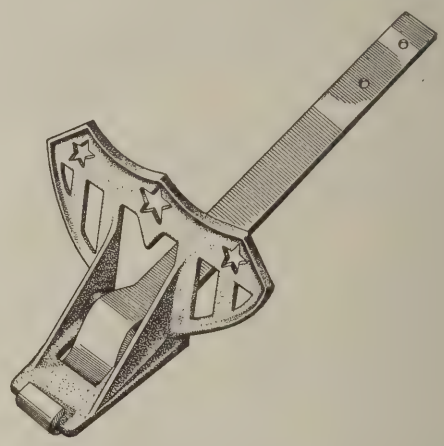


Fig. 7—The "Standard Bar Loop" Snow Guard

are shown in Figs. 7 and 8 of the accompanying illustrations. In reference to the "Standard Bar Loop," the claim is made that durability, strength and appearance have been maintained at a minimum cost. It is to be noted that the casting is attached to the strap, which goes under the slate in such a manner as to make a strong guard without weakening it with holes or rivets. This guard has a very wide base, which rests on several slate instead of on one, as is common with the ordinary snow guard. This guard is slightly smaller than the makers' "Standard Spring Loop," a

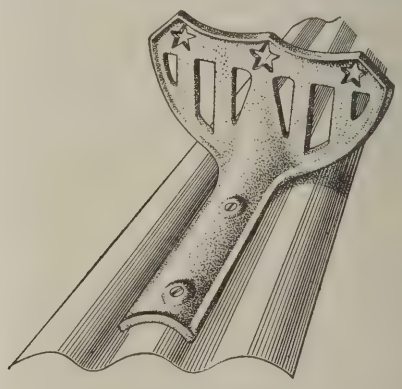


Fig. 8—The "Standard Corgate" Snow Guard

description of which appeared in the columns of this magazine some time ago.

The "Standard Corgate" shown in Fig. 8 is adapted for use on corrugated iron roofing. It is applied by riveting, or bolting to the corrugated metal, or by nailing through the metal to the sheathing boards beneath. If nails are used, lead washers are suggested to insure against the possibility of leaks. It will be noted that the guard is so made that it is intended to be used on the top of the corrugation to minimize the possibility of a leak at the point of attachment. Only the best gray iron is used in the castings and rolled steel in the construction of the "Standard" line of guards.

There's beauty and durability and satisfaction for contractor, architect and owner in every brushful of

TRADE MARK **NICE** REG. U.S.A.

VARNISHES
WOOD FILLERS
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Prices, Samples, Literature on request.

EUGENE E. NICE, Philadelphia

Containing Colored Supplemental Plate with Plans and Details

Building Age



DECEMBER, 1917

PRICE 20 CENTS

WE ARE

Not Dependent upon Germany for Coloring Materials

USED IN THE MANUFACTURE OF

HUDSON ASPHALT ROOFING PRODUCTS

FOR ANY KIND OF BUILDING

☐ **Hudson Asphalt Shingles**

Mineral surfaced Red, Green Mottled furnished in Individual Shingles 8" x 12¾" and in strips 10" x 40" with 5 shingles to a strip. Hudson Strip Shingles can be very quickly laid.

☐ **Protection Brand Roofing**

Mineral Surfaced; has 6" lap. (Pat. Nov. 18, 1902.) Laid with all nails covered.

The Mineral Surfaces used in the manufacture of Hudson Shingles and Protection Roofing are in their natural unfaded colors. No artificial coloring used.

☐ **Hudson Brand Asphalt Felt**

For built-up roofs. For sheathing buildings and reinforcing slate and tile roofs. You will like Hudson Felt. It is pliable; will not dry up or crack, as it does not stick at the butts. You can use every inch of it.

Asphalt Ready Roofing Co. Dept. 52, 9 Church St. New York

Cut out this advertisement and put an X in the ☐ along side of the material you are interested in. Mail it to us and we will gladly send samples.

Name .....

Address .....

FLOORS

The Wood-Mosaic Kind



For every home—Old or New. Can be installed by your mechanics. Our 5/16" flooring can be laid in old or new houses. We make all kinds and thicknesses; Wood-Carpet, strips Plain and Ornamental Parquetry, Tongue and Groove Flooring.

Send accurate measurements of rooms for colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free catalogue in natural wood colors.

Wood-Mosaic Company

32 Hebard St., Rochester, N. Y.

Saw Mill and Flooring Factory, New Albany, Ind.
Sales Office and Parquetry Factory, Rochester, N. Y.

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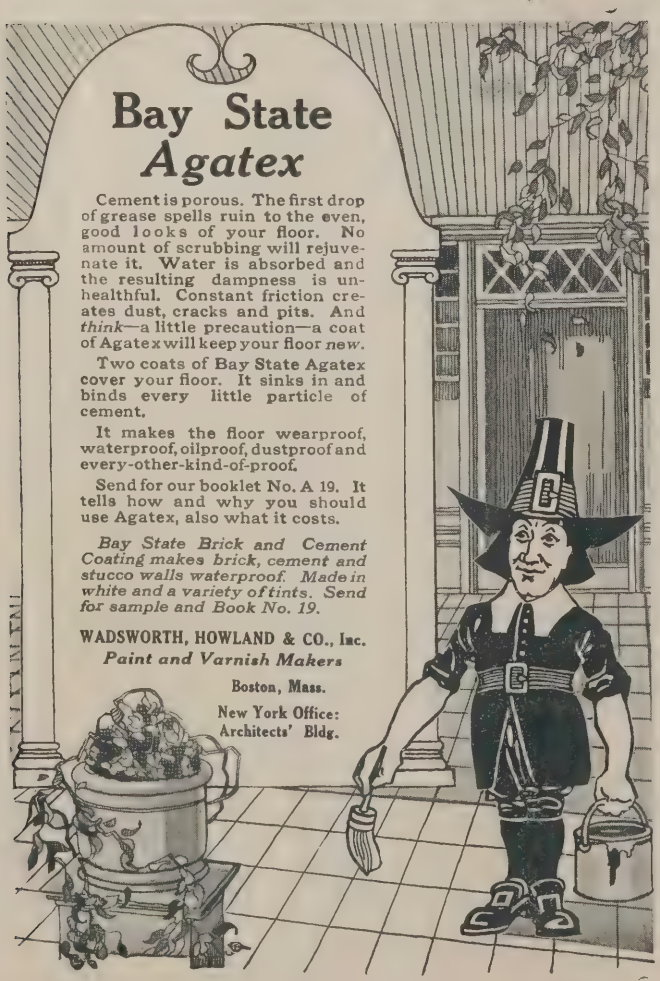
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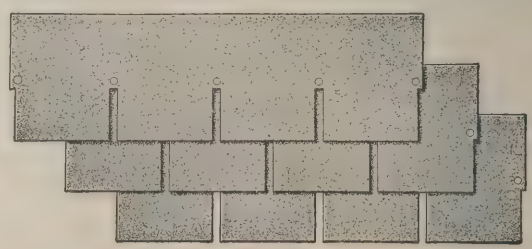
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The Building Age

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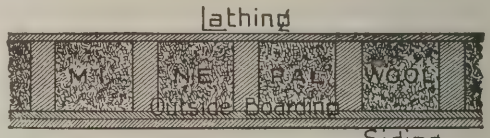
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Section of Outside Wall of House, Showing Wool Between Studding.

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BUILDING AGE

NEW YORK, DECEMBER, 1917

A Swiss Châlet With Basement Garage

A Type Somewhat Different from the One Illustrated in These Columns Some Time Ago

By Charles Alma Byers

ALTHOUGH the style, as variously interpreted in this country, does not by any means necessitate such a location, the Swiss châlet possesses many characteristics that make it charmingly adaptable to the sloping hillside. In fact, while it may be so handled as to make it entirely suited to the perfectly level city lot, it is doubtful if there is any other style of home architecture than it which can be employed for the rugged and picturesque location, ranging from the mildly to the extremely so, with more satisfactory results.

As showing its possibilities in this direction, the house here illustrated is especially interesting. The plot of ground utilized in this instance is, of course, only mildly irregular, or sloping, but, as will be plainly evident to the builder, a house of the same general plan and character would prove equally suitable to grounds possessing irregularities or a slope much more pronounced. In brief, with but slight changes in respect to its elevations, if any were required, this attractively interpreted châlet may be easily imagined as nesting against a veritable mountainside, amid most picturesque surroundings.

This particular châlet is also interesting because of its basement garage. Due to the ground slope, a basement area of considerable dimensions has been naturally provided underneath one end of the main floor level, and it is to utilize a portion of this space that the garage has been introduced as a direct adjunct of the house. With a graveled drive-

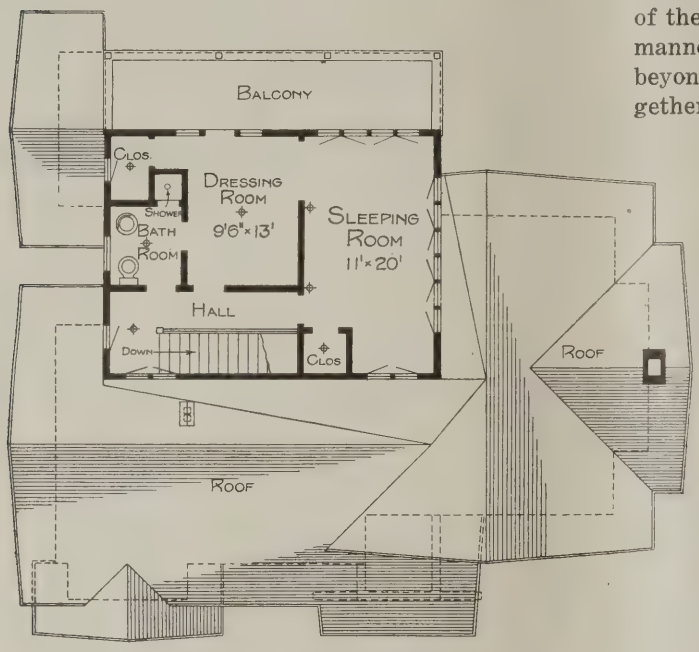


The Front Approach to the House Showing the Entrance to the Garage at the Left—Arthur L. Acker, Architect, Los Angeles, Cal.

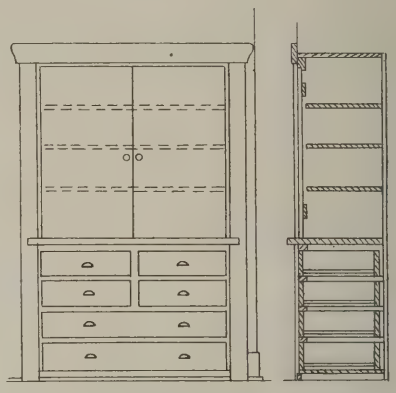
way approaching it on a level, common with the street in front, the garage is made conveniently accessible for the car, and by means of a stairway descending from the interior the owner is enabled to enter or leave it without passing into the open. All in all, it constitutes a most convenient arrangement, and one that will be found desirable in any

structure in the main is but one story high, although rising above the center is a sort of second-story addition, of full ceiling height—which story, because of its character, is known to the Western builder as an "aeroplane." Exclusive of a 3-ft. inglenook extension at one end, the house has a frontage of 46 ft. 8 in. and a depth of 43 ft.

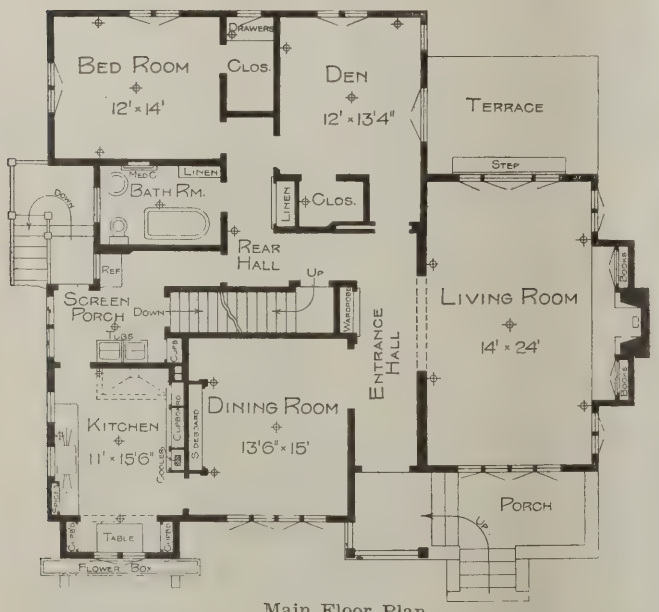
Possessing a total of eight gables, the roof lines of the house are quite broken and irregular, and the manner in which the roofing timbers are projected beyond the wide extension of eaves and gables, together with the brackets used in conjunction there-



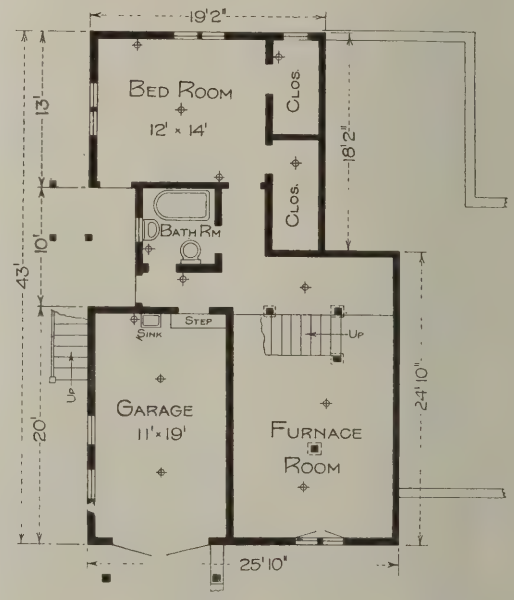
Second Floor Plan



Elevation and Section of Linen Cupboard in Hall—Scale ¼ In. to the Foot



Main Floor Plan



Basement Plan Showing Location of Garage

Scale 1/16 In. to the Foot

Floor Plans and Constructive Detail of the Swiss Châlet with Basement Garage

number of cases where the home must of necessity occupy a similar location.

The house, while maintaining the general characteristics of the châlet style, is designed along lines more or less original, and presents an appearance that, in its entirety, is most attractive and rather striking. Exclusive of the large basement area, the

with, comprises a most effective detail. The roofs are of comparatively slight pitch, and are covered with a gray roofing composition, laid in tar and surfaced with crushed granite. The rafters, of 3 x 6-in. material, are spaced 30 in. on centers, and are covered with tongued and grooved sheathing, while the overhang in the eaves and gables, amounting

ordinarily to 3 ft. 6 in., is ceiled. The horizontal pieces of the gable brackets are 8 x 8 in., and the bracing pieces are 6 x 6 in., which, together with



Another View of the Châlet Showing the Left-Side Elevation

all other exposed framing timbers, are of California redwood, left rustic.

The exterior walls are covered with split cedar shakes, exposed 12 in. to the weather, and laid over diagonal sheathing. All gables are boarded in vertical fashion, with 1 x 8-in. boards of rustic redwood, spaced approximately an inch apart. All window and door frames are constructed from clear pine, surfaced; and, exteriorly, they, as well as all other outside woodwork, excepting the shakes, are painted grayish-buff in color. The shakes, however, were given only a coat of oil, and are being permitted to take on a weathered appearance.

As comprising the main entrance, there is a small front porch, inclosed by a low brick wall, and with brick steps leading thereto. Only a portion of it, however, is covered, save by the ordinary gable extension of the roof, and as constituting the roof for this fully covered portion there is a hood-like arrangement extending from over the front door. This hood is ceiled and is supported by two bracketed 8 x 8-in. posts, in conjunction with which is created a simply designed wood railing.

The entrance to the garage consists of double Dutch doors, each of which is set with four small squares of glass, near the top. Over the entrance is constructed a long flower-box, supported at each end by an 8 x 8-in. post and bracketed 8 x 8-in. crosspiece. In addition to the glazed doors, the interior of the garage is further lighted by two small windows, located in a side wall.

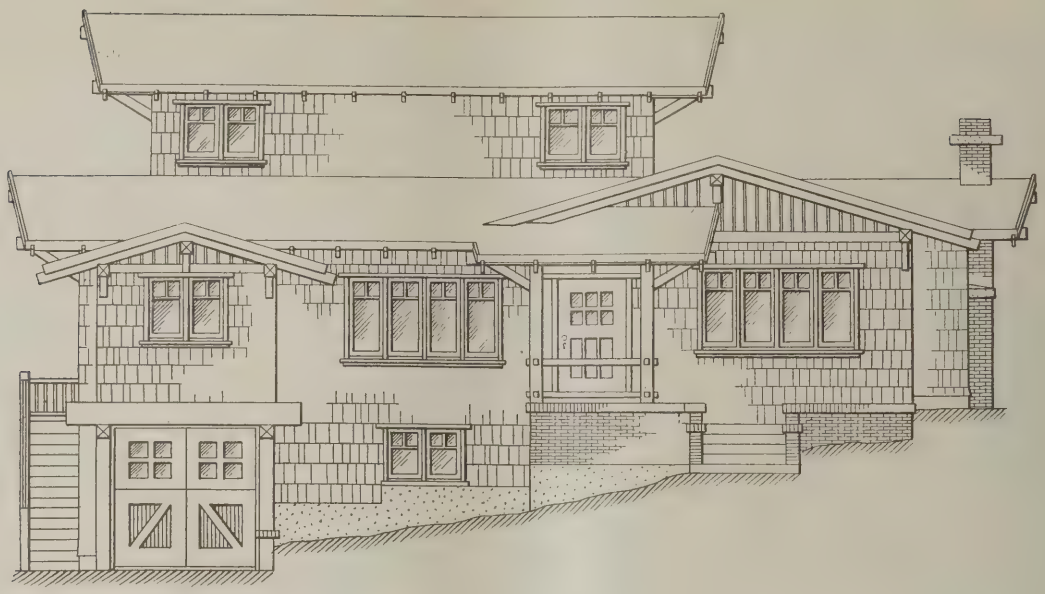
What ordinarily constitutes the rear or kitchen entrance is, in this case, located on one side, a little more than half way back, and is reached by an outside flight of wood steps. This stairway, as well as the landing and entry, is guarded by a vertically boarded railing, the boards of which are 1 x 6 in., spaced an inch apart. The upright supports of the stairway are 4 x 4-in. posts.

In the rear is a most delightful second-floor balcony, reached from a large dressing room, and from it is commanded an excellent view of the surrounding hills and valleys. It is also roomy enough to enable its being used for outdoor sleeping, if such use of it were to be desired. Its floor is constructed with a slight slope, and is decked with canvas imbedded in white lead and painted with waterproof paint. It is surrounded by a low wood railing designed similarly to that used for the side stairway. The posts of this railing are 4 x 4 in., the handrail is formed by a flatwise 3 x 8, and the vertical boarding, consisting of 1 x 6-in. pieces, spaced an inch apart, are held in place at both top and bottom by a double belting of 1 x 4-in. material.

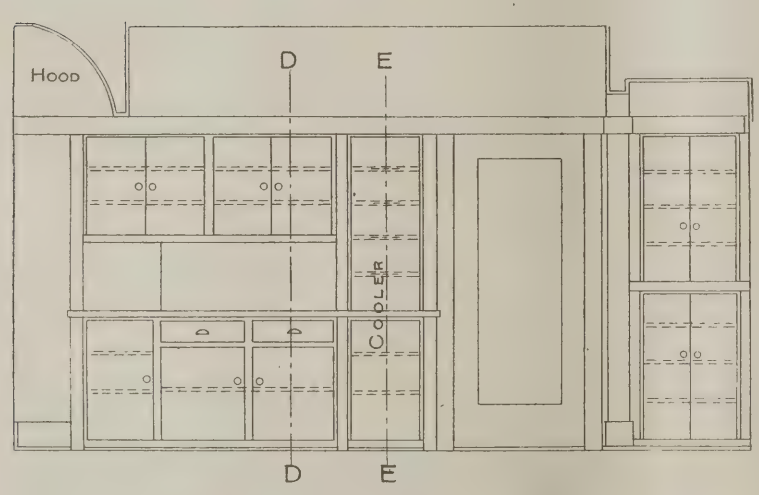


A Direct Front View of the House Taken Early in the Season

In the rear also, but on the main-floor level, is an open terrace, which, without overhead covering, is protected only by two angles of the walls of the house and the natural wide overhang of the roof.



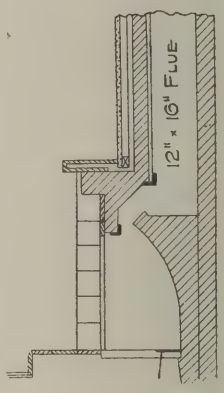
Front or East Elevation of House Showing Entrance to Garage at the Left—Scale 3/32 In. to the Foot



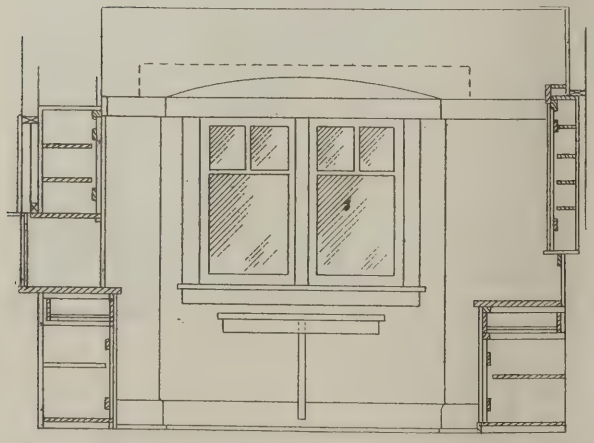
Elevation of Kitchen Cupboards with Alcove Cupboard Shown at Extreme Right—Scale ¼ In. to the Foot



Vertical Section on Line E-E



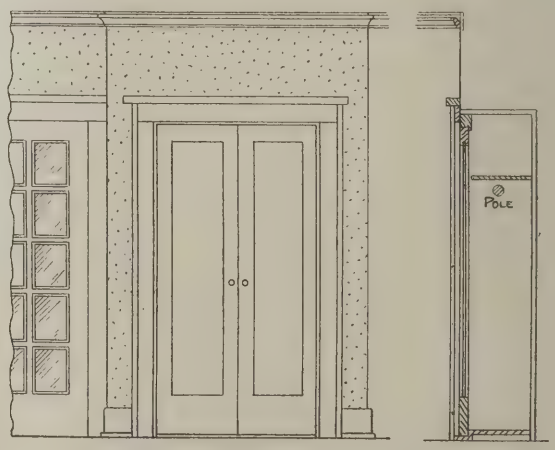
Vertical Section Through Fireplace —Scale ¼ In. to the Foot



Section D-D

Elevation in Kitchen Alcove Scale ¼ In. to the Foot

Section Through Spice Cupboard



Elevation and Section of Wardrobe in Hall—Scale ¼ In. to the Foot

Front Elevation and Miscellaneous Constructive Details of Swiss Châlet

It is reached from the inside, from both the den and the living room, by means of French doors. In dimensions it is 14 x 6 in. by 13 ft. 10 in., and it



Entrance Hall Showing Arched Opening to Living Room at the Right, and French Doors to the Dining Room at the Left. A Glimpse of the Den Is Seen in the Background

is floored with red cement edged with red brick.

The house rests on a foundation of solid concrete, naturally of varying elevations, which in all cases is bedded at least 12 in. below the natural grade. All walls extend 6 in. above the grade, are 8 in. thick, and possess footings 16 in. wide and 8 in. high. All piers measure 8 in. square at the top, and all except two have a 12 x 12 in. footing, the footing of the two excepted being 18 in. square. The whole of the basement area utilized is floored with concrete, which flooring, including that of the front porch and the rear terrace, is 4 in. thick, exclusive of a ½-in. finish coat of Portland cement. All concrete work consists of a mixture of one part cement and five parts clean sharp sand and coarse gravel.

All concealed framing timbers used in the house are of Oregon pine. The posts used for all piers are 4 x 4 in., all girders are 4 x 6 in., and all studding, except for a few of the inside walls, where 2 x 4 material is used, consist of 2 x 6 in. timbers, while the sills, halved and nailed together at the corners, are of the same dimensions as the studs. All floor joists over the basement area are 2 x 10 in., and elsewhere they are 2 x 6 in., everywhere spaced 16 in. on centers. The rafters and the outside timbers have been mentioned elsewhere. The floor joists are well bridged and the walls thoroughly braced.



Breakfast Nook of the Kitchen

The exterior walls are sheathed with ⅞ x 8 in. matched and surfaced Oregon pine, laid diagonally, and over this sheathing are laid the split cedar shakes, and exposed 12 in. to the weather. All floors, except where pine is used, are laid over a sub-floor, which consists of ⅞ x 6 in. Oregon pine laid diagonally.

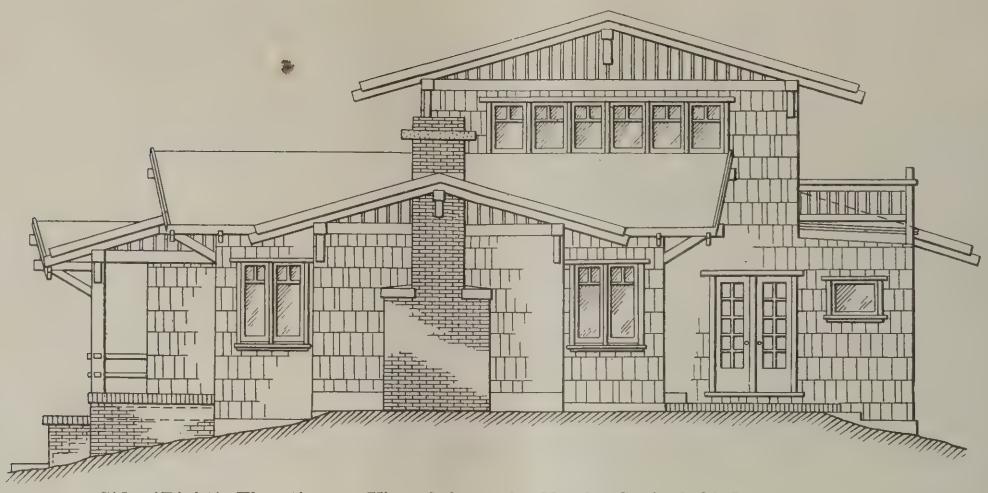
The basement plan includes the garage, a large furnace and fuel room, a bedroom, a bathroom, and two roomy closets, with necessary connecting hallway. The rooms may be reached either directly from the outside, by way of the garage, or from a stairway descending from the kitchen-entrance porch of the main floor; and hence comprise, in addition to the other conveniences, well-arranged quarters for servants. All these rooms, including the garage, have lathed and plastered walls, and the walls of the bedroom, bathroom and hallway are also attractively tinted. A ceiling radiator is a rather unusual feature of the bedroom, and the bathroom is equipped with all the usual conveniences, while the garage is provided with a sink and running water.

The front entrance to the main floor leads into a long, irregular-shaped hall, from which direct connections are provided to every room on this floor, except the kitchen, and from which rises the staircase to the second story. A broad, arched opening, plastered, gives access from it to the living room; French doors on the opposite side lead into the dining room, and a single sliding glass door of similar design connects with the den on a direct line with the entrance.

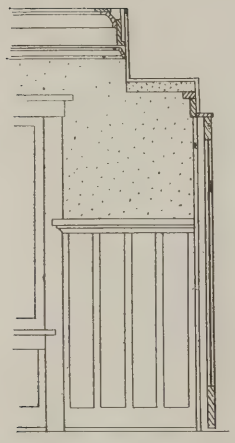
The built-in features



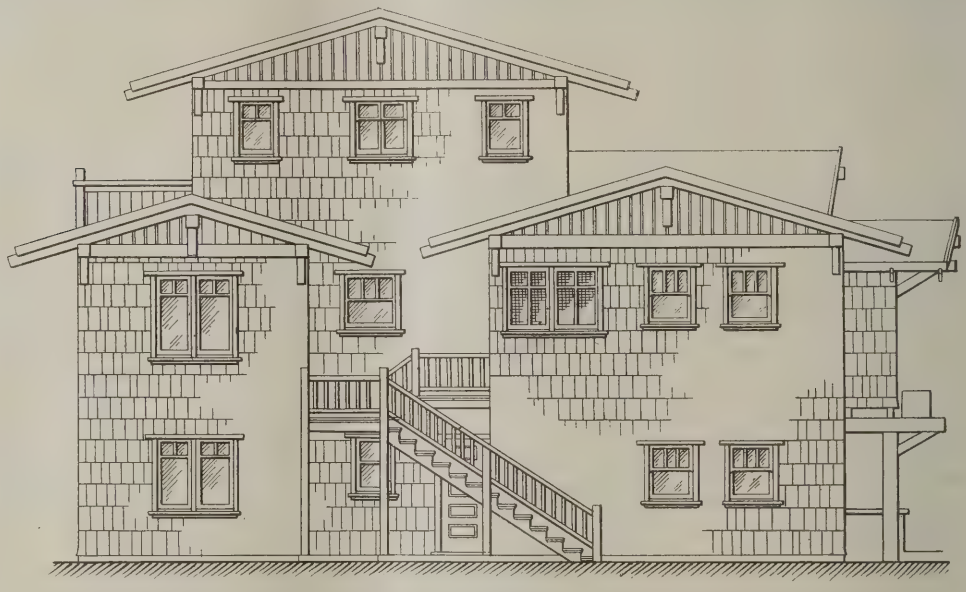
The Living Room Fireplace with Built-In Bookcases on Either Side



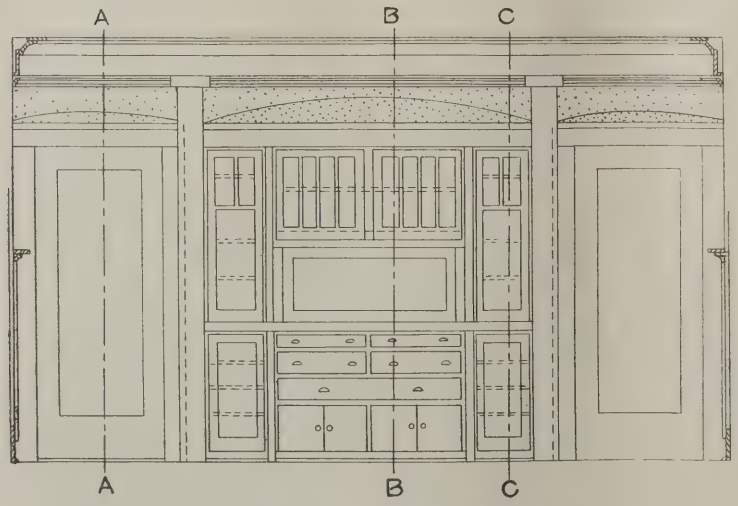
Side (Right) Elevation as Viewed from the North—Scale 3/32 In. to the Foot



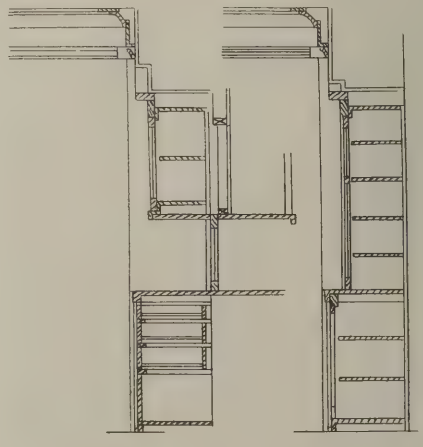
Partial Elevation in Dining Room, Showing Wainscoting and Section on Line A-A—Scale ¼ In. to the Foot



Side (Left) Elevation Showing Outside Stairway Approach to the Main Floor—Scale 3/32 In. to the Foot



Elevation in Dining Room Looking Toward Built-In Buffet—Scale ¼ to the Foot



Section on Line B-B Section on Line C-C

Scale ¼ In. to the Foot

Elevations and Miscellaneous Constructive Details of Swiss Châlet with Basement Garage



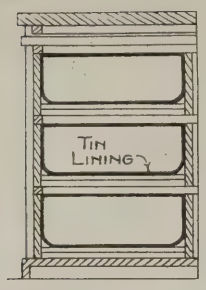
View in the Living Room of the Châlet Looking Across the Hall and into the Dining Room Seen at the Extreme Right

of this floor are particularly numerous and desirable, as well as of excellent design. The hall, for instance, contains both a wardrobe closet and a linen cupboard, as well as a roomy closet underneath the stairway; the living room has built-in bookcases with glass doors, in a sort of inglenook, at either side of the fireplace; the dining room contains a combined sideboard and cupboard; the kitchen possesses a small breakfast alcove with collapsible table and two small cupboards, as well as a draft cooler, a hood for the range, and the other usual conveniences. On the screened porch are two stationary laundry tubs and a broom closet; the

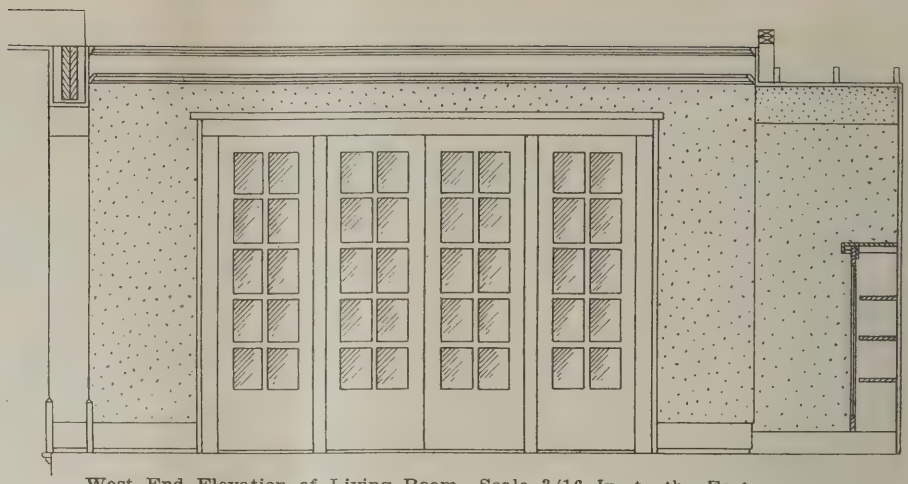
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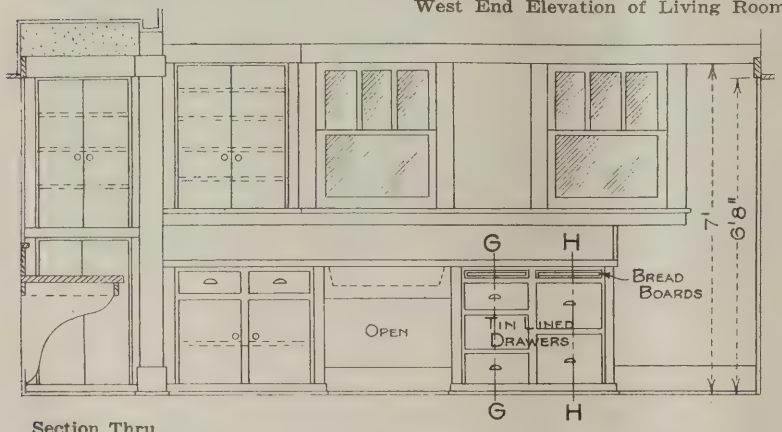
A Corner of the Living Room of the Châlet, Showing the Fireplace at the Right and at the Left the French Doors Opening to the Rear Terrace



Section of Tin-Lined Drawers on Line G-G of the Elevation

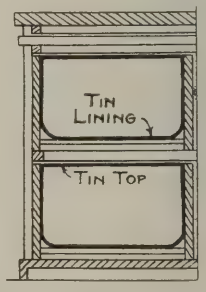


West End Elevation of Living Room—Scale 3/16 In. to the Foot



Section Thru Alcove

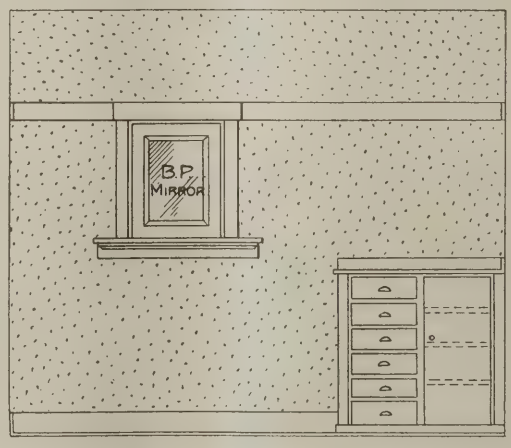
Elevation in Kitchen Looking Toward Sink

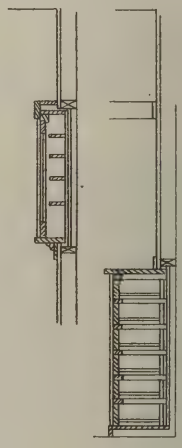


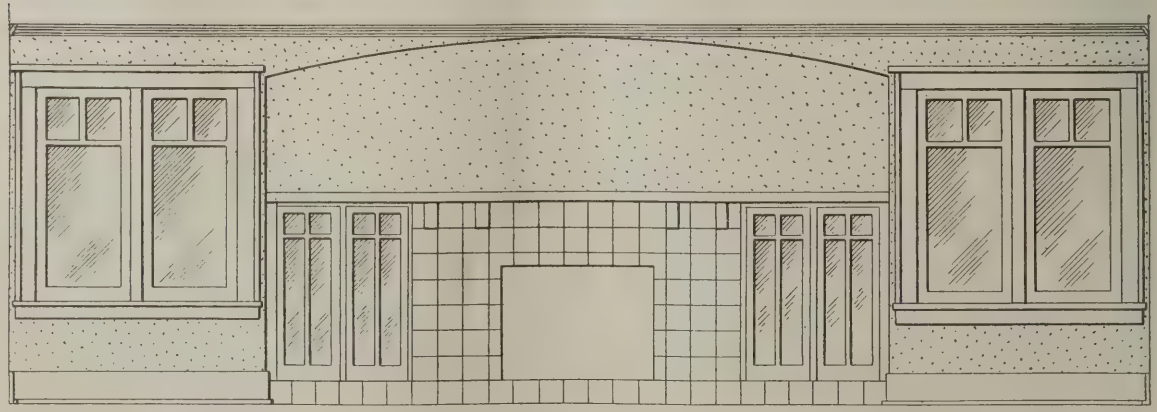
Section of Tin Lined Drawers on Line H-H of the Elevation

At the Right Is Shown Elevation in Bath Rooom with Linen Cabinet and at Extreme Right Are Sections of Medicine Case and Linen Cabinet

Scale ¼ In. to the Foot







Elevation of North Side of Living Room Showing Open Fireplace and Bookcases—Scale 3/16 In. to the Foot

Miscellaneous Constructive Details of Swiss Châlet with Garage in the Basement



A ROW OF SMALL COMMERCIAL BUILDINGS WITH ARTISTIC FRONTS IN BOSTON, MASS.

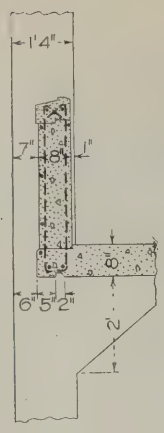
Artistic Fronts for Small Business Buildings

Examples of Architectural Treatment for Such Structures Which the Builder Will Appreciate

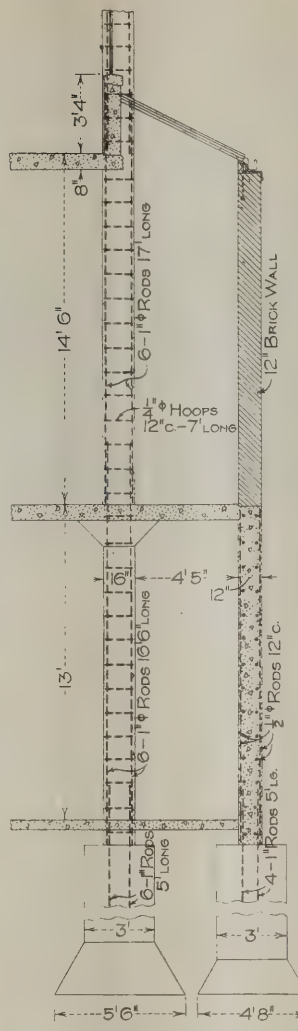
IT is coming to be a well recognized fact that the man doing business in a small way and occupying a building in keeping with his requirements, is likely to be much more successful in a well kept office or store with a well designed façade than to follow the somewhat loose methods that heretofore have been so common of doing business in an untidy and unattractive building. With a view to showing what may be accomplished in a small way with a row of two-story store and office buildings, we present herewith pictures of a garage, a real estate office, a ladies tailoring establishment, a laundry, etc., the general architectural treatment of which is clearly indicated in the panel picture at the top of the page. The larger picture here shown represents a detail of the garage front while the line drawings on another page afford the reader an idea of some of the more



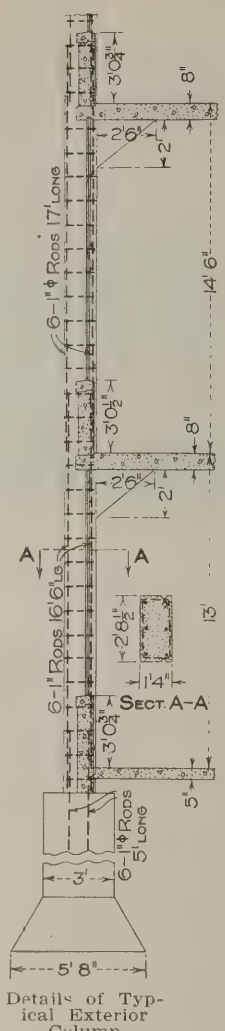
Front Elevation of a Garage in Beacon Street, Boston—Frank J. Robinson, Architect



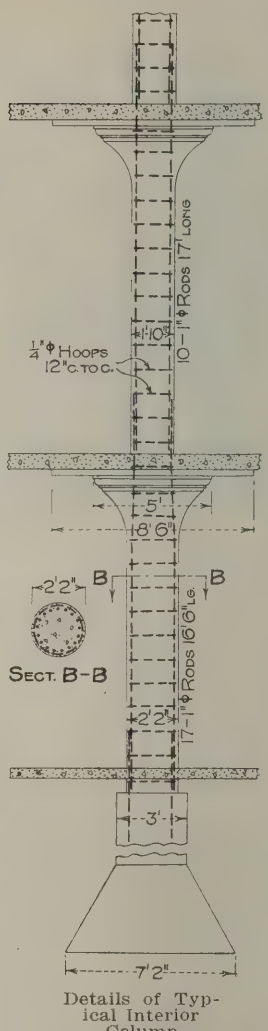
Section Through Curtain Wall—
Scale ¼ In. to the Foot



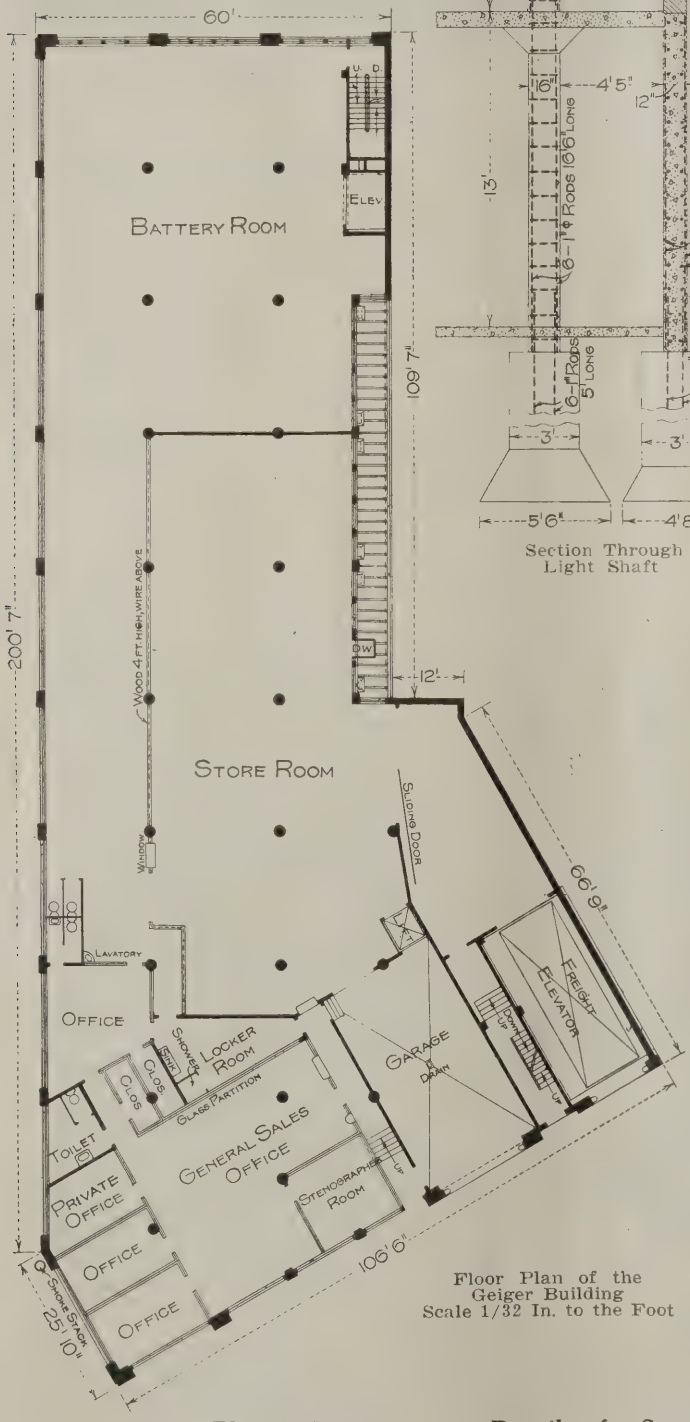
Section Through
Light Shaft



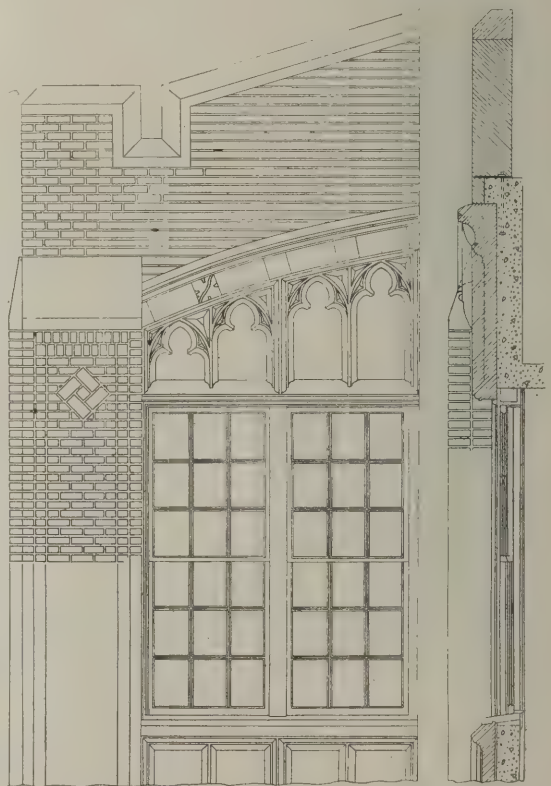
Details of Typ-
ical Exterior
Column



Details of Typ-
ical Interior
Column



Floor Plan of the
Geiger Building
Scale 1/32 In. to the Foot



A Detail of the Facade—Scale 3/16 In. to the Foot

Plan and Constructive Details of a Small Commercial Building in Boston

important constructive details. This garage is located on Beacon Street in Boston, and was erected in accordance with plans prepared by Architect Frank J. Robinson, 44 Bromfield Street, Boston, Mass. It is known as the "Exide" building and was erected for Albert Gieger, Jr.

The building has a frontage of 106½ ft., a depth of 226½ ft. and a width at the rear of 60 ft. The front portion is arranged in offices as shown on the floor plant presented on another page. The other portion of the floor is devoted to a store room and a battery room with lavatory, toilets, etc.

The building is of reinforced concrete construction of the continuous flat slab type built monolithically with the supporting columns. The slab is 8 in. thick with 8 ft. square dropped panels forming an additional thickness of 3 in. over each column. The column capitals are of the flaring type, 5 ft. in diameter at the top. The wall beams are above the slab, allowing the windows to extend to the ceiling, thus affording a maximum of light. Besides the advantage of unbroken light, the flat slab construction allows large open floor space.

The reinforced concrete columns and beams on the elevation are veneered with 4 in. of water-struck brick and cast stone.

The contractors who executed the work were the W. F. Kearns Company of Boston, Mass.

We also present a detail of one of the façades shown in the panel picture on the first page of the article, this being a real estate office.

In all of these designs are embodied elements of good proportion and a clever handling of materials that will provide good suggestions for application to cheaper forms or the use of other and perhaps local materials.

Eliminate "Greeting" Cards This Year

At this time, when practically the entire world is at war and when money is sorely needed to alleviate suffering, reduce hunger, and care for the sick and the wounded, it seems a waste of money to purchase and distribute such unnecessary and unproductive things as holiday greeting cards and it has been suggested by the Universal Portland Cement Company in conjunction with a number of other leading concerns in the West, whose custom it has been to distribute such cards, that they refrain from so doing this year, but instead contribute the money to war relief organizations where it will perform some real service. The companies in Chicago which have decided not to send out greeting cards this year are engaged in the cement business, the steel business, the railway supply business and in allied lines, but there is no reason why the movement should be confined to any particular section of the country or to any special line of industry. Many corporations and thousands of individuals throughout the country are now planning their form of greeting and it is thought that if the matter is brought



A Detail of One of the Façades Shown in the Panel-Picture on the First Page of This Article

to their attention in the right way by a country-wide publicity campaign, hundreds of thousands of dollars can be diverted into relief channels where so much money is needed at this time. Another thing to be considered in this connection is that the supply of labor in all parts of the country is wholly inadequate for necessary, important and productive enterprises. The successful outcome of a movement of the character indicated would release from non-productive and consuming enterprises labor which would be diverted into productive lines.

Cost of Building To-day and Two Years Ago

Great interest has been manifested for some time past on the part of the building world to know approximately at least how actual construction costs compare with a period a few years back or say at a time when conditions more nearly reflected the real influences of the gigantic European confiict.

As throwing much light upon the subject there has just been issued the first official comparison in building construction costs and those of two years ago, the work being that of Russell B. Smith, C.E., for the Dow Service Daily Building Reports. The compilation shows that costs in the present building material and labor price market and those prevailing when the 16-story fireproof building at the corner of 38th Street and Madison Ave. was erected are only 30.7 per cent higher today instead of from 50 to 75 per cent as has been roughly estimated by owners.

The following summary of the percentage of increases is of more than usual interest:

Architectural terra cotta, 27.7 per cent.
Boiler stack, 229.5.
Electric wiring, 25.4.
Carpenter work, 5.1.
Elevators, 87.6.
Exterior limestone, 30.4.
Fireproofing, 53.0.
Glass and glazing, 125.
Granite, 37.8.
Hardware, 31.4.
Heating, 132.7.
Interior marble, 20.
Mail chute, 10.
Masonry, 22.
Metal doors, 25.
Ornamental iron, 77.7.
Painting, 128.5.
Plastering, 22.5.
Plumbing, 41.2.
Plumbing fixtures, 35.
Roofing and Sheet metal, 31.5.
Sprinklers, 129.4.
Stair treads (asphalt), 29.
Steel erection, 25.
Steel fabrication, 172.7.
Tile, wainscoting and floors, 30.9.
Waterproofing, 5.
Windows, 9.
Kalamein, 50.7.

Metal Roofing in the Maine Woods

Sheet metal roofing is comparatively new in the northeastern section of the Maine woods, but it is gaining in favor each year. Personally I have done little of this work, although I have laid the standing seam variety for iron roofs and the flat soldered seam for tin roofs, says a correspondent writing in a recent issue of the *Metal Worker, Plumber and Steam Fitter*. I feel as though I had yet a large experience to acquire. From what I have seen it seems to me that the clause often seen in catalogs of sheet metal roofing which reads, "This roofing can be laid over wooden shingles," should be amended somewhat.

I have seen this kind of metal roofing put on buildings by men who claimed to be experienced, but I would not allow a roof put on as they do it for a camp if I owned it. One nice farm near here has the iron laid over the shingles and the workmen even laid it over the weather boards at the ridge, leaving a space 1 in. deep at the ridge the whole length of the building between the iron and the old shingles. Neither do I like the way such roofs are generally fixed around the edges. On a shingle roof the iron is simply turned around the ends of the shingles at the eaves and left in almost any old way. At the gable ends it is simply turned down over the edge and nailed, which produces a rough, unsightly appearance. This work is mostly contracted for by the "square" and all the contractor is looking for is to get it on as cheaply as possible.

While a fairly good job can be done on a roof where the shingles are in average good condition, it should not be put on over shingles that are badly worn or decayed. For a finish at the eaves I like a strip of board nailed on along the bottom edge of the roof and this board sawed with one feather edge so that it gradually tapers from the thickness of the board at one end to about ⅛ in. at the other. This enables the metal to be turned down and finished nicely. Another good way is to form up a strip in the brake so that it runs beyond the shingles 1½ in. and then turns back about 1 in. and has another 1½ in. turned down, so that it can be nailed to the roof boards and form a drip. The same method of making the finish at the gable end adds to the appearance.

This, of course, would add to the labor and the cost, but it adds the same amount or much more to the value of the property in the way of appearance. This strip formed up in the brake can be put on before the iron roof is put on, and then the roofing can be finished up to it. If one edge is turned up the standing seam of the iron roofing can cover it and be squeezed down tight with the tongs, the mallet and iron, according to what the workman has. This will make a solid, tight, neat-looking roof.

I have heard the complaint that if iron is laid directly on the roof boards it is very noisy during a rain storm. This can be avoided, however, by putting under it a layer of heavy building paper.

There is no doubt that competition has a deplorable effect on the quality of the workmanship and the methods which the workmen are allowed to follow in doing different kinds of work. It seems to be clearly shown in all kinds of roofing work.

A new custom house consisting of a reinforced concrete building 68 x 75 ft. in plan and two stories in height is about being erected in Puerto Plata, Santo Domingo. Nearby will be a one-story shed of steel and zinc sheets, the shed covering an area of 75 x 260 ft. and costing about $30,000. These two building,s we are informed by Consul Arthur McLean, are to be erected on a percentage basis by an American construction company under the supervision of the Public Works Department of the Dominican Government.

How An Old Stucco Job Was Made To Look Like New



By Bricksand Mottar

"HELLO, Bricksand! How would you like to look over a stucco job which is having the cracks filled up and the color restored?" said a friend of mine the other day. "A chap by the name of Rogers over at Flushing, Long Island, is doing it."

This rather vague description interested me, so I hopped on a Long Island train and got off at the wrong end of Flushing.

The town is a nice place all right, but it gave me to Broadway and Twenty-eighth Street. Lordy, such a lot of people with vast knowledge of the town! Six different and unrelated people gave me five different and unrelated directions as to how to get there. One man wanted me to go back to Brooklyn.

But I landed on the job in spite of the denizens of Bridge Street—a man has to be a human compass to get to a place when he tries to follow small town directions. You know how it is. "Just go down two



The Work in Progress—Note the Contrast Between the Renewed Surfaces of the Enclosed Porch and Those of the Front of the House Above the Porch Roof Which Have Not Been Treated

a rotten feed—cost me seventy cents too. You can bet your sweet life I'll steer clear of that particular joint in the future—I only like to become a regular visitor where the cookery is good enough to make a fellow have that real happy feeling.

Well! I was at Bridge Street and wanted to get blocks and you'll see a red house. Then you turn that way and go till you see a saloon"—they all know where the saloon is—that's a landmark. "And then you turn"—a lot more fool directions that leave you way up in the air. But ain't it the grand and glorious feeling when you really land?

I landed all right; walked right in the open door of the house just like I had a right there. Mr. Brooks was upstairs trying to get some cement out of his eye. He said it hurt.

Safeguarding the Jewels

Darn nice house inside, it was. But we got outside where the real work was to be done. Coming downstairs I couldn't help but think of the time when I was working with an old chap named "Tommy." He and I were out on a job together. The lady of the house saw us two roughnecks come into her dainty domicile, and got scared.

"Elizabeth," she called out, "put my jewels in the safe and lock it."

"Say, Bricksand," said Tommy to me significantly, as he took his Ingersoll and 14-karat chain out of his pocket, "Take this back to the shop. It seems this place here isn't safe."

When Mr. Rogers and I got outside he pointed out a few cracks which had developed in the stucco —the job was about four years old.

"A lot of them cracks was caused by the carpenters. They come into a house before the stucco is well dried out and bang the windows up and down. Then last year the big guns at Fort Totten were being tried out, and the vibration caused a few cracks to appear, but not many."

How the Stucco Was Applied

"How was the stucco put on at first?" I asked.

"We put on waterproof paper over the sheathing, and then put on furring strips. When we stretched the expanded metal on, we fastened it with galvanized staples every six inches. I've seen it put on with nails bent over, but I'm afraid to do a job like that. I always watch the putting on of the mesh myself so as to be sure it's done right—that's half the job. We put on three coats. The last coat was of pebbles, white sand, and white Portland cement."

"Just how are you getting rid of the cracks and dirt in the stucco?"

"We're putting on an over-coat of white Medusa Portland cement—about one shovel of white sand to three pails of cement, and use a wooden paddle with which to put it on. We could have washed the old stucco down with a hose, but putting on an over-coat like this fills up the cracks and makes a first class job which will last.

The Stucco Below the Water Table

"Now, you'll notice that the stucco below the water table is of a darker tone. We used brown sand and ordinary cement there. If we'd make it pure white like the rest of the house, mud would splash up and it would show dirty. This way, the dirt don't show so much. Then we'll paint the water table and trim brown. The old stucco was put on in the summer—we do all our stucco work when there is no danger of freezing."

"Do you have much trouble with stucco work around here?" I asked.

"Do you see way over there in Bayview? There's a man over there put up four stucco houses about three years ago, and every one of them has the stucco hanging off in big chunks. But that's because of the way he put it on. He used a certain patent plaster that's good only for inside work, when the frost gets at it, it busts all to pieces. When the stuff's put on right there's no trouble—maybe only a few small cracks like this house."

He told me the name of the cement used—it is widely employed in bathrooms, etc., and it is not the firm's fault if a fool builder uses it outside.

Fixing Stucco Against an Outside Chimney

"I was talking with a chap the other day about fixing stucco up against an outside chimney. How do you do it?"

"Well, we leave a little space between the sheathing boards, about a quarter of an inch, and then pack the stucco in tight so that it will get a good clinch. See that chimney over there? There's not a crack in the stucco alongside of it, and it's been up five years."

"Well, I'm obliged to you, Mr. Brooks. I'll get busy now and take some pictures."

I got my camera out and all set up. While my head was under the focusing cloth a kid wandered up. Kids have a habit of picking up a plate holder and pulling the slide out so as to look at the picture just taken. So I threw the cloth off quick.

The kid was looking at the camera very gravely and earnestly. He walked all around it, subjecting it to a close examination. Then he stopped and looked again.

"Say, Mister," he piped, "Please show me the little birdie!" I guess the kid had been having his picture taken.

Well, it began to look like rain, so I packed up and beat it home.

Outside Elevator for a Building

Owing to the architectural design of the court house in Los Angeles, Cal., and its location on a hill, the elevator is placed outside of the walls. One of the streets on which the building fronts is two stories lower than the court house, and the elevator shaft runs down to the level of the street. Access from which is gained by means of tunnel underneath the court-house lawn. The shaft is of steel construction with a circular front and ornamental iron work at each floor. The design would hardly be practical in any except a mild climate, and the elevator is said to be the only one of its kind in operation.

What Woman Wants in a Home

Woman is tired of a home that is too large, where the third floor gets dirty while she is cleaning the first, of a home that cannot be left lest it should be burglarized, of a home where there is always a slate wrong or a broken window or a shortage of coal, says W. L. George in *Harper's Magazine*. She is tired of being immolated on the domestic hearth.

Convention of Ohio State Association of Builders' Exchanges

Matters of Vital Interest Discussed—Reports of Affiliated Exchanges—Cost of Building Materials

THE city of Akron is located on the highest point in Ohio, geographically speaking, and it is perhaps natural that its citizens should have a high ideal of hospitality. All of the expectations of its visitors in this respect were fully realized at the eleventh annual convention of the Ohio State Association of Builders' Exchanges, held in the "Summit City," or, as it is now better known, the "Rubber City," on Wednesday and Thursday, Oct. 24th and 25th. From the standpoint of both business and pleasure this convention was accounted the best ever held by this largest of all state associations of builders.



Sitting—Left, Scott Porter, President. Right, R. L. Watson, First Vice-President.
Standing—Left, E. A. Roberts, Secy-Treas. David Burnet, Third Vice-President. V. D. Wolfe, Second Vice-President.

Many matters of vital interest to the building industry of the State as well as the nation were acted upon at the meeting. Among these were the adoption of a resolution recommending that the standards in the relations between employers and employees existing before the war be not changed by violent measures while this country is engaged in the war; a resolution providing for restoring injured and crippled soldiers to industry; a resolution promoting the use of the Standard Uniform Documents, and a strong recommendation that all of the Ohio Exchanges affiliate with the national association. The convention went on record in opposition to the demand of some architects that payment shall be made for the use of plans in estimating building work.

For the first time in its history the association received a representative from the Ohio State Association of Architects, and was also honored with the attendance of a representative of the Ohio Building Supply Dealers' Association, both of whom delivered interesting addresses. The National Association of Builders' Exchanges was represented by its President R. K. Cochrane of Pittsburgh, who made an interesting address at the banquet attended by about three hundred visitors and members of the Builders of Akron Exchange.

Features of the entertainment included the banquet and a fish fry and chicken dinner at one of the nearby lake resorts followed by an afternoon inspection of the factory of the Firestone Tire & Rubber Company.

The headquarters of the convention were at the Portage Hotel, where the sessions were opened in the assembly room at 1.30 o'clock on the afternoon of Oct. 24. The hall was beautifully decorated with flags and bunting in honor of the occasion, and a large banner over the entrance to the hotel as well as another in the main lobby welcomed the visitors on their arrival. As the delegates entered the hall they registered at a table presided over by two young ladies, who pinned badges on their lapels. These badges consisted of a name plate to which was attached a ribbon of cream-colored rubber upon which were printed in gold letters the name of the city and that of the State association as well as the date of the convention. A large envelope containing souvenirs of Akron in the form of small rubber

tires, a pair of miniature rubber boots, toy balloons, complimentary tickets to the banquet and the fish-fry dinner, etc., were presented to each man as he registered.

Nearly all of the affiliated bodies which now number fourteen were represented when President L. E. Fishack of the association rapped the convention to order. He introduced Rev. W. L. McCormack, pastor of the First Presbyterian Church, who offered the invocation. A cordial address of welcome was extended to the convention by Hon. W. J. Laub, Mayor of the city, and also by H. P. Moran, president of the Master Builders' Association of Akron.

A response to these addresses was made by President Fishack, after which the annual report of the secretary was presented by Edward A. Roberts. In this report attention was called to the affairs of the association and the record of the year's work.

Reports from Affiliated Exchanges

Reports from affiliated bodies indicated that most of the organizations were in a prosperous condition, although some of them gave evidence of a slowing down on account of conditions resulting from the war.

Akron

The Akron Exchange reported a membership of two hundred and twenty-five and a slight lessening in building operations, which for some time have been abnormally good on account of the demands of the rubber industry.

Canton

For Canton it was reported that the exchange is progressing well and that building operations are prospering with the exception of house building.

Columbus

The Columbus delegates reported a membership of two hundred and forty-five. Attention was called to the plans for holding a real estate and building show in the state fair ground buildings on January 21st to 30th under the auspices of the Builders' and Traders' Exchange and the Columbus Real Estate Board. The convention accepted an invitation to cooperate in making this show a success.

Cincinnati

For Cincinnati Secretary Burnet said that the motto, "Forward Going and Spirit" has been adopted for that exchange, and that an entire building 22 ft. by 90 ft. in dimensions and comprising six floors had been leased by the Exchange. On the top floor plan rooms to accommodate large sets of plans and thirty or forty members figuring at once have been established. Three floors are devoted to office space, one floor to trade organizations and the ground floor to exchange quarters and assembly room sufficient to seat two hundred persons. A permanent motion picture machine has been located on this floor for the purpose of giving frequent exhibitions. The exchange now has one hundred and eighty-five members and is about to undertake a campaign to largely increase this number.

Cleveland

The Cleveland Exchange reported an increase of fifty new members during the year and a program of activities in harmony with its progress during recent years. The second liberty loan campaign was heartily supported and upwards of $100,000 of bonds were sold to members, including the purchase of $3,000 for the Exchange's individual account.

Good reports were also made from Toledo, Mansfield, and other cities connected with the association.

Co-operation Between Architects and Builders

A feature of this session was an address by Herbert B. Briggs, of Cleveland, Secretary of the Ohio State Association of Architects, on co-operation between architects and builders in Ohio. The association of architects was organized a year ago and this was the first time that it was represented at the builders' annual convention. The address of Mr. Briggs was well received and was regarded as significant of the good relationship existing between the architects and builders in the Buckeye State.

Recent Developments in Workmen's Compensation

The Ohio Industrial Commission was represented at the convention by P. F. Casey, rating actuary of the Employers' Liability Department. Mr. Casey spoke on "Recent Developments in Workmen's Compensation." He stated that the theory of the Ohio law is that groups of employers in any industry may pool their interests and obtain administration of the fund according to the results in such groups. The actuarial department revises rates and rules; the auditing department collects the premiums and sees that all amounts are paid in as required; while the claims department makes adjustments to injured workmen and conducts all matters relating to claims. Mr. Casey stated that rates are fixed as the result of experience in the various groups of employers so that these employers really establish the basis of the rates in their trades. The groups of good accident record are given better rates than those of bad record. For every $100 of loss saved by an employer through accident preventative measures he is refunded $10 on his premium.

The Increase in Rates

A radical increase in rates in workmen's compensation has been made in nearly all of the states during the past year. Mr. Casey claims that the Ohio rates are lowest of any state operating on a similar plan. He said that the increase in that state came about through the Legislature increasing the amount to be paid in case of death by one-third, and also lengthening the time of payments on injuries by one-third. "Approach of war causes industry to be hard pressed in producing the maximum amount of materials," he remarked, "and many untried men were given employment. It was natural under these

conditions that there should be more accidents. This has resulted in more claims being presented for compensation and has caused increases in certain rates from fifty to two hundred per cent."

Mr. Casey called attention to the amendment passed at the last session of the Ohio legislature making owners and general contractors responsible for injuries that may occur to employees of sub-contractors unless said employees elect to hold the sub-contractors themselves responsible. He also emphasized the passage of House Bill No. 1, which provides that the state should be the sole authority of insurance, debarring private companies from operating in this field. In concluding his address he said, "We believe after six years of experience with the Ohio law that our state both from the standpoint of employer and employee as well as for the interest of the general public has the best law of any state in the union. As field actuary I want to impress upon you that the maintenance of the fund is the employers' business and not that of the state. It is our effort to make our plans in Ohio co-operative and mutual. All warrants isued on the fund as well as all receipts for the fund are handled through the Treasurer of State rather than by the board itself. This we think gives to the system elements of confidence which it might not otherwise have."

An interesting discussion followed the address in which many points were brought out by the delegates and were explained by Mr. Casey.

The largest attendance that ever graced a banquet of the Ohio State Association was present at the complimentary dinner held at 6.30 o'clock at the Firestone Club. Delegates from the convention were taken from the hotel to the club in automobiles as guests of the Akron builders, who tendered the banquet in honor of the visitors. The club is a feature of the welfare department of the Firestone Tire & Rubber Company, and occupies a large portion of the building devoted to this department. Previous to the banquet the visitors were entertained with a swimming and diving contest in which six young ladies in an act entitled "The Diving Venuses" gave an exhibition which threatened for a time to render the banquet an obsolete affair. A large orchestra provided music for the dinner. The program consisted largely of patriotic airs in harmony with the decoration of the hall.

The only formal address was given by R. K. Cochrane, president of the National Association of Builders' Exchanges, who was the guest of honor. Mr. Cochrane devoted himself largely to the work of the national association, emphasizing the merits of the Uniform Standard Documents and urging all exchanges to promote the use of these documents in their respective cities. He also called attention to the importance of promoting ethical practice in the building trades and reviewed the report of the committee of the national association which has this matter in hand. He discussed for a time the so-called Nelson Form of estimating which received consideration at the Atlanta convention and will be given further attention at the next national convention to be held in Pittsburgh in February.



Banquet at the Eleventh Annual Convention of the Ohio State Association of Builders' Exchanges Held in Akron, Ohio

Labor to Be a Feature of Discussion at the Coming Pittsburgh Meeting

Mr. Cochrane said that while the national association had not heretofore taken a very lively interest in labor matters there was a growing demand that it should take up this subject and that it would be made a feature at the Pittsburgh meeting. He concluded his address with a patriotic appeal to the builders to do their part in the war and invited Ohio to send a large representation to the national convention. A vaudeville entertainment of high order was given following the address of Mr. Coch-

rane and kept the crowd in a rollicking humor until nearly midnight.

Thursday Morning Session

At the opening of the Thursday morning session an address was made by Ralph P. Stoddard, Manager of the Ohio Builders' Supply Association on "Present and Prospective Cost of Building Material." This address caused a lively discussion indicating a wide divergence of opinion as to whether prices will come down after the war or not. In the course of his discussion of the subject Mr. Stoddard said:

Prospective Cost of Building Material

They put people in jail in Ohio for attempting to read the future; so far be it from me to try to tell you what the prices of building materials will be six months or a year from now.

It has been assigned to me to talk about costs of materials present and prospective. That's just another way to introduce the subject of "Build Now," and to my mind it is almost a patriotic duty to boost for this movement that aims to keep conditions normal in the great building industry.

Magnitude of the Building Business

People outside of the building business have not awakened to the fact that building construction is about the biggest single industry in the United States. It is stated that one-eighth of all the people in the country are in some way connected with the building industry. In volume it is second to railroading. In 1916 there was reported from 24 cities $60,000,000 in new construction. This does not include the other millions spent in smaller towns and rural communities where records are not compiled. Neither does it include the road, bridge, sewer, sidewalk, underground and landscaping work that always go with public improvement.

In new buildings alone in only 24 cities $60,000,000!

Yet a banker said to me less than two weeks ago:

"We have money to loan for business and industry, but none for building—we class buildings as extensions and we feel it our first duty to keep the going enterprises on their feet through these uncertain times."

This banker will loan money on stocks of goods, upon the stock certificates of manufacturing companies because he has them classified as going industries. He can see the wheels go round, and if appealed to by the merchant or manufacturer he will provide money to keep them moving.

No Money to Loan for Building Construction

This condition, more than the price of building materials, affects present conditions in the building industry. I am not going to say that conditions are not good—especially am I not going to say such a thing while in Akron, where everything is running "in high" with the accelerator wide open. I am told there are thousands of people here begging for homes, so we do not have to explain any slump here.

There are similar conditions in Cleveland. Homes are being occupied before they are finished—that is literally true. One builder, who puts up from 100 to 150 homes a year, told me he never saw such a demand for homes. People move into a home as soon as one floor is finished and don't mind the carpenters and decorators going on with the work.

Increase in Factory Building

Practically every live factory in that city is building a new plant or an addition, yet there is a prospect of a sharp falling off in building work during the winter unless the banks and building and loan associations resume construction loans. I am positive that the money stringency, not high prices of materials and labor, are responsible for any slacking that may appear in the figures for the later months of the year.

Now we will get down to the prices, because that is what the contractor wants to know about. He is a fiend for low prices—no matter how low they are, he wants them lower, they tell me. As a matter of fact I believe that a lot of this talk about high prices and its killing effect upon business is "indoor sports" on the part of the contractor. The fellows who talk so much about high prices remind me of the Mississippi river steamboat Lincoln told about. It had a five-foot boiler and a seven-foot whistle and when they blew the whistle it stopped the boat. Let us not waste any steam blowing about the high prices; instead boost the business by encouraging building.

Buildings Using Steel and Concrete

In buildings using steel and concrete the increase is great, as you know better than I do. But don't let the owner forget that the earning power of the building has increased correspondingly. In fact, by what law could the prices of building materials be kept down while every other community in the country is increasing in cost? A dollar at market attracts about as much attention as a Boy Scout would at Chillicothe, and still there's a panic because builders' supplies show an average increase of about 30 per cent.

Plumbing costs more than double the price of two years ago. The labor increase in the past year has been large, and this enters into building costs in two ways—it is the basis for nearly all the advance in materials, as it is the biggest item in manufacturing costs, and it comes to bat again in construction work.

Rates of Wages

There have been advances in Cleveland ranging from 15 per cent to 70 per cent in builders' trade wages. Did you ever consider that practically every material that goes into building, especially the fire resisting materials, come out of the ground? Clay costs practically nothing per ton until labor is employed to dig it out, haul it to a mill, grind it, mould it, dry it, bake it and load it into wagons or trucks to be drawn to a job. The man who stands in his tracks and picks a brick and places it in a wall gets more for it than the manufacturer got for making that brick and hauling it to the job. And the ingredients of cement all come out of the ground and are mixed with labor to produce the finished materials. As labor goes up, goods must go up—the manufacturer is not to blame—the dealer certainly is helpless in the matter.

Will Prices of Materials Be Lower?

Will prices be lower? Can they be reduced unless the manufacturing and handling costs are reduced?

In my opinion, nothing less than a general panic will bring them back to old levels. The law of supply and demand unquestionably is at work as usual. If the demand falls off so sharply that there is an oversupply there will be reductions. Plants that have an output of hundreds of carloads a day have been able to ship only a score or two of cars a day on account of empty car shortage. The plants have their books covered with orders. They are under the same overhead and operating cost that there would be if they were shipping their capacity. Do you think they will reduce prices under these conditions? With a million men going to war, will labor be cheaper? What ground have we to look for lower prices? Even government regulation doesn't seem to make living cheaper.

How Long Will Present Conditions Endure?

Let us face the condition as it exists—the world is at war—every condition is unusual—wages never were so high before in the history of the country—there are no idlers. Bank resources are at the highest figure known—$16,000,000,000 in June report. Deposits in

national banks are $18,000,000,000, an increase of $2,000,000,000 in a year. All along the line new records in every department of banking. The cities are prospering as never before. Look at Akron. It has the atmosphere of a western town of the early gold days—it's bursting with growth. It is the same to greater or less degree wherever there is manufacturing. Farms are prospering beyond their expectations, with big crops to cash in at the highest prices they ever knew.

These conditions will last while the war lasts, and then think of the rebuilding and the enormous demand abroad for all materials.

Don't think prices are high. Compared with all other things, building prices are not high. Get that idea in your mind. Tell it to the fellow with money to invest—*talk up*—not down. Don't waste steam making a big noise that you ought to be using to go ahead with.

Ohio Builders and the War

An address by Cary R. Alburn, Esq., attorney of the Building Trades Employers' Association on "Co-operation of Ohio Builders in the War," was well received and elicited considerable enthusiasm.

He pointed out what other nations were doing in the way of organizing and providing training schools for injured and crippled soldiers and cited some examples illustrating the value of this work. He referred especially to schools which had been established in England for teaching carpentry, cabinet making, polishing, carving and gilding, picture framing, building and construction.

A Big Field for Action

"Here," he said, "is a big field for action and co-operation among Ohio builders. The time is near at hand when our American soldiers will be returning in a maimed and crippled condition. It is our clear duty and our privilege in case of men who sacrifice not only their business but risk their lives for their country to see that the men in industry in the United States and especially in Ohio arrange vocational training for these men and provide work for them—work that they can do efficiently and that will bring them returns in money, in satisfaction, in self-respect and in the happiness resulting from the attainment of these objects.

"The builders and Builders' Exchanges of Ohio can assist and promote this work by educating the public to these things; by urging new vocational schools for crippled and the extension of existing manual training in other schools and institutions and by working out lists of positions which may be taken by injured soldiers. Ohio builders can be of material assistance to the Government in this war by maintaining the status quo of conditions in industry while the war lasts.

Some Recommendations

"In line with the recommendations of the National Conference Board, made before the Council of National Defense at Washington, on Sept. 6, I would urge you during the continuance of the war not to take advantage of war conditions to better your own situation at the expense of any other class of industry or society, but I would likewise urge you to see to it during the period of stress that other classes of society and industry do not better themselves at your expense. In this connection I would urge special attention to the legislation in this state."

Resolutions

The committee on resolutions presented a number of important declarations which were adopted after full consideration by the convention. The committee consisted of Messrs. Albrecht of Toledo, Jergeson of Cincinnati, Hibbs of Columbus, Donley of Cleveland, Lander of Canton, Small of Mansfield and Moran of Akron. The following are the more important of these resolutions:

Resolved, That in harmony with the various national and State associations of employers throughout the country, the Ohio State Association of Builders' Exchanges herewith adopts the following resolutions relative to the attitude of employers and employees toward each other in fostering the productive industries of our State and country to the end that peace and harmony may prevail in said industries and the maximum benefit accrue to our country in the present great crisis.

To epitomize our conclusion and recommendations we urge:

1. That as a basis of mutual understanding employer and employee recognize and agree that now and for the period of the war continuous, efficient production can alone equip and sustain our military forces. Every dispute, whatever its motive, which interrupts production, furthers the ends and operates to the advantage of the public enemy.

2. The nation needs the service of every citizen. Its industrial workers are as indispensable to victory as the soldier on the firing line. The non-union man is as necessary in the factory as he is in the army. On economic as well as indisputable moral grounds the Government can therefore neither permit nor tolerate the exclusion of any laborer from productive employment. We, therefore, urge the Council of National Defense to adopt and reassert as its guiding principle the fundamental American doctrine authoritatively stated by the Anthracite Coal Strike Commission, with the approval of representatives of both employers and unions included in its membership and commended as the basis of industrial adjustments by Presidents Roosevelt, Taft, and Wilson.

"That no person shall be refused employment or in any way discriminated against on account of membership or non-membership in any labor organization; that there shall be no discrimination against, or interference with, any employee who is not a member of any labor organization by members of such organization."

3. The Councils reiterated recommendation that

"employers and employees in private industries should not attempt to take advantage of the existing abnormal conditions to change the standards which they were unable to change under normal conditions."

should now receive an unambiguous interpretation to assure its practical application as a working principle. To this end we propose:

(a) That applied to existing statutory regulations intended to promote safety and health it shall be agreed that for the period of the war there shall be no suspension or modification of such provisions, except upon recommendation of the Council of National Defense after due investigation by its agencies and when, in its judgment, required by the exigencies of war.

(b) Applied to wages, demands shall be tested by the prevailing local standard of the establishment in effect at the beginning of the war with such modification as may be shown to be necessary to meet any demonstrated advance in the cost of living.

(c) Applied to hours, the standard shall be those established by statute or prevailing in the establishment at the beginning of the war, subject to change only when in the opinion of the Council of National Defense it is necessary to meet the requirements of the Government.

(d) Applied to what are commonly known as "open" or "closed" shop conditions, it shall be understood and agreed that every employer entering the period of the war with a union shop shall not by a lockout or other means undertake to alter such conditions for the duration of the war, nor shall any workman or combination of workmen undertake during the like period to "close" or "open" shop.

4. Adopting these standards as the basis of its operation, we recommend the creation of a federal board, to be appointed by the Council of National Defense, to

adjust labor disputes for the duration of the war; the activities of this board to be confined to disputes growing out of employment on the subject matter of war production for the Government. To such board shall be primarily referred for final settlement all major disputes of the nature suggested, with full power to create all machinery necessary to execute its functions. Its decision must bind all parties to the dispute. It should be constituted equally of representatives of employees, employers, and the Government, representatives of the latter to hold the deciding voice in the event of an equal division of opinion. It is to be further understood and agreed that there shall be no interruption of production by strikes, lockout or other means within the control of employer or employee.

Urge Use of Uniform Contract

Resolved, By the Ohio State Association of Builders' Exchanges, that we strongly urge all affiliated bodies to promote the use of the Standard Uniform Contract adopted by the American Institute of Architects and the National Association of Builders' Exchanges. We believe that the use of these documents will reduce the misunderstanding and disputes in our business, and result in great benefit to the industry. The provision of arbitration alone commends these documents for general application and we feel that there should be no delay in adopting them throughout Ohio.

Join the National Association

By Mr. Albrecht,

Resolved, That we recommend to all affiliated bodies of our State association that they join the National Association if they are not already members. We believe that such action will be of great benefit not only to the individual exchanges, but also to our State and national organizations, enabling them to effect a closer co-operation for the good of the building industry in general.

No Pay for Use of Plans Used in Estimating

Resolved, That the practice of some architects throughout the State in requiring payment for the use of plans used in estimating for work to be performed through their offices is considered unjust and should be abolished.

We believe that instead of requiring contractors to pay for the privilege of making estimates for owners, with only fair chance of securing the work, a custom should be established whereby contractors should be remunerated for the time given to this work. The experience gained by contractors through years of effort in their business is of great benefit to owners as well as to architects and by right should not be contributed for nothing.

We, therefore, recommend that our affiliated bodies take action in their respective communities in an endeavor to have the practice of charging for the use of plans discontinued.

Aid for Crippled Soldiers

Resolved, That this association herewith recommends to Governor Cox that steps be taken at once to encourage the creation of facilities for restoring Ohio soldiers that may be crippled as the result of the present war, so that in so far as possible they may be self-supporting and contribute their part to the industrial life of the commonwealth.

This recommendation is based upon the experience of foreign countries where surprising results have been obtained through carefully made plans with this object in view. All of the Allies have established such institutions, either through public or private means, and we believe that our own State should be among the first to make preparations of similar character. Should these preparations happily be found unnecessary through an early culmination of the war, the consideration of the subject will be helpful for application during the future peaceable operation of the industries of the State.

Vote of Thanks

Resolved, By the Ohio State Association of Builders' Exchanges, that a hearty vote of thanks is hereby extended to the officers and committees of the Master Builders' Association of Akron for the very complete and satisfactory arrangements made for the entertainment of this convention. We realize that there is a large amount of work necessary to prepare for such meetings and appreciate the hospitality which prompts men to give their time during these busy days to such duties.

Not only are the features of entertainment such as to cause all of the visitors to congratulate themselves that they came to Akron, but no detail for the comfort of the delegates has been overlooked. We readily submit that all the promises made by the Akron delegation at the Toledo convention have been kept and that we can give them a receipt in full for the same. The memory of this convention will long live in the minds of every one who is present coupled with a feeling of gratitude which this resolution can but faintly express.

We also thank all those who participated in the addresses and other features of the convention. The meeting as a whole we regard as one of the best ever held by our association.

Election of Officers

All the new officers were elected by unanimous vote and were as follows:

President—Scott Porter of Akron.
1*st V.-Pres.*—R. L. Watson of Columbus.
2*nd V.-Pres.*—V. D. Wolfe of Mansfield.
3*rd V.-Pres.*—David Burnet of Cincinnati.
Secy.-Treas.—Edward A. Roberts of Cleveland.
Asst. Secretary—Clarence Metters of Columbus.

Time and Place of Next Meeting

The time and place of the next convention were referred to the incoming officers to determine. The business of the convention was terminated with a vote of thanks to the Akron Exchange for the generous entertainment and splendid arrangement of the meeting.

Fish and Chicken Dinner

Automobiles provided by the Akron builders conveyed the visitors to Young's Hotel on Long Lake south of Akron, where a bounteous chicken and fish fry dinner was served at 12.30 o'clock. The crowd enjoyed this feature very greatly making merry during the time of the dinner with songs and story telling. Following the dinner the party returned to Akron where arrangements had been made for an inspection of the Firestone Tire & Rubber Company's factory at 3 o'clock. Small groups in charge of competent guides were given an interesting tour of all departments of the factory where the details of making rubber tires and other products were explained

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A New Roofing and Panel Material

A product which, it is said, will be of special value in the work of European construction when the war is ended is an asbestos-cement sheathing, plain and corrugated, a plant for the manufacture of which has been established at Bold in Lancashire, Eng., writes Consul Horace L. Washington at Liverpool. The new product will compete with various materials hitherto used for paneling and roofing, and more particularly with galvanized iron. It is claimed that the sheeting is fireproof and will last for many years. The process of manufacture is described as similar to that of paper making.

Some Convenient Buildings For the Farm

By W. E. Frudden

As the harvest season is brought to a close and the long evenings of winter are near at hand, the farmer has opportunity for considering his requirements for the next season and to decide what is best to be done in the way of improvements. He is naturally interested in the design and arrangement of barns for various purposes as well as other farm buildings, and the structure which is first considered in this article is such as to contain features of possible value. It is a cattle feeding barn, the lower portion of



Fig. 1—Barn for Feeding Cattle

which is of concrete and covers an area 34 x 56 ft. It has a silo at the far end as shown by the picture Fig. 1 and the plan, Fig. 2, and there is a feeding alley running through the center of the building with concrete mangers on both sides and hay feeding racks on both outside walls. All the feeding is done under cover and with a small amount of labor.

The silage carrier from the silo deposits its load directly into the mangers on the sides of the feeding alley, while hay from the mow is thrown directly into the feed racks.

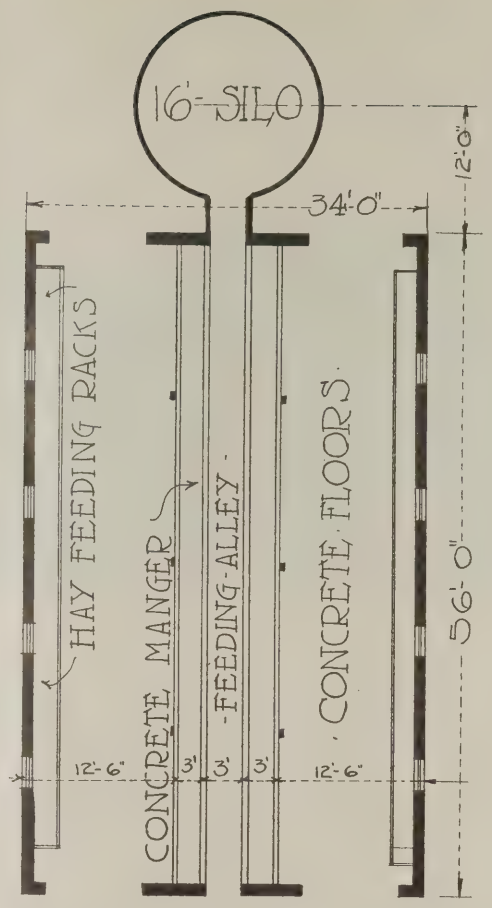


Fig. 2—Plan of Barn Showing Position of Silo

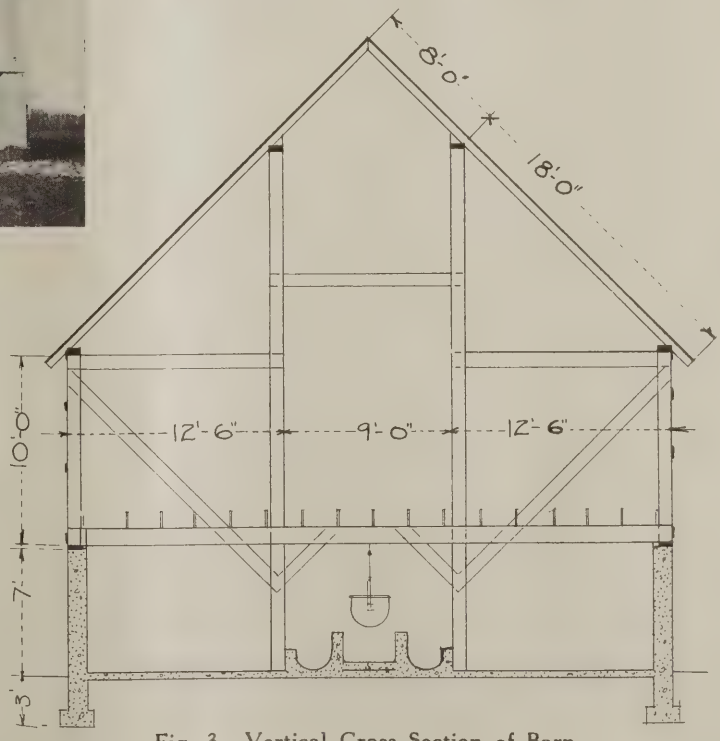


Fig. 3—Vertical Cross Section of Barn

A barn of this nature with all the first floor construction of concrete is practical for a cattle feeder's farm as there is no flimsy construction to be always in need of repairs. The plain gable roof is built on a stiff plank frame, the general arrangement of the timbers being clearly indicated in the vertical cross section Fig. 3 presented herewith. It also shows the concrete mangers and the silage carrier.

One of the many minor buildings about a farm

is the shed for protecting the cheaper grades of hay and that which in many sections of the country is often used for bedding purposes. The hay shed shown in Fig. 4 is built on cedar poles spaced 8 ft. apart. The sides are open as shown in the picture and the roof is covered with common



Fig. 4—A Cedar Pole Hay Shed

boards and battens. The shed may be extended to any length required to meet the needs of the farm. The one here shown is 32 ft. long and 24 ft. wide and is of such a nature that farm talent can build it. The cedar poles are 26 ft. long and are set when possible in concrete to a depth of 2 or 3 ft., as shown in the vertical cross section Fig. 5. The poles can be raised two at a time, which means that one bent of the structure will first be put up and then another and so on until all are raised. The framing is done on the ground where it is most convenient.

The two poles are laid out on the ground 24 ft apart and then 3 ft. down from the top are two planks running across the shed from pole to pole. These planks are spiked to the poles, although a better construction is to bolt them securely. Then place the short angle braces, these consisting of 2 x 8 in. pieces doubled. The lower ones are 9 ft. long and the upper braces are 6 ft. in length. In doing the work first make the six frames that are needed and do this before raising any of them.

Just as soon as the bents are raised into place, nail on the outside girts or braces so as to tie them together and firmly hold them in place. By using 16 ft. lumber for the girts, two bents can be tied together at a time.

The next step should be the roof work. The rafters are cut at half pitch and spaced 4 ft. apart with cross girts to strengthen them and to support the roof boards and battens. A 2 x 6 in. collar beam is nailed to the rafters so as to have a foundation for the hay carrier track which runs through the entire shed. Some farmers consider it a good plan to board up the side walls for a short distance but this is not necessary at first.

With the rapidly increasing interest in alfalfa growing in all sections of the country, the demand for an inexpensive hay shed similar to the one here shown has become quite general. It can be erected at any place, in the field or in the barnyard, to meet conditions. Forage crops have a great value and on high-priced land the advantage of providing shelter for the entire hay crop is of the greatest importance. Stacking in the field without the cover means loss and deterioration. In a year or two this cheap hay shed will be paid for where large amounts of forage are grown on the farm.

Bill of Materials

The following bill of materials is of interest in this connection:

12 cedar poles 26 ft. long for posts.
10 pieces 2 x 10, 24 ft. long for cross ties.
40 pieces 2 x 8, 9 ft. long for lower braces.
20 pieces 2 x 8, 6 ft. long for upper braces.
20 pieces 2 x 8, 16 ft. long for girts and plates.
8 pieces 2 x 8, 16 ft. long for lower girts.
18 pieces 2 x 6, 18 ft. long for roof rafters.
40 pieces 2 x 6, 8 ft. long for roof girts.
1300 ft. roof boards and battens for roofing.

Another cattle feeding barn and one which is very popular among Iowa farmers is illustrated in Fig. 6. It is simple in construction, but strong and serviceable and so arranged as to be very convenient. A common size is 56 x 48 ft. In this sort of barn the entire center portion of the structure, as shown on the plan Fig. 7, is given over to the storage of hay. The mangers are located around the hay so that the roughage will require to be handled but very little in feeding the steers.

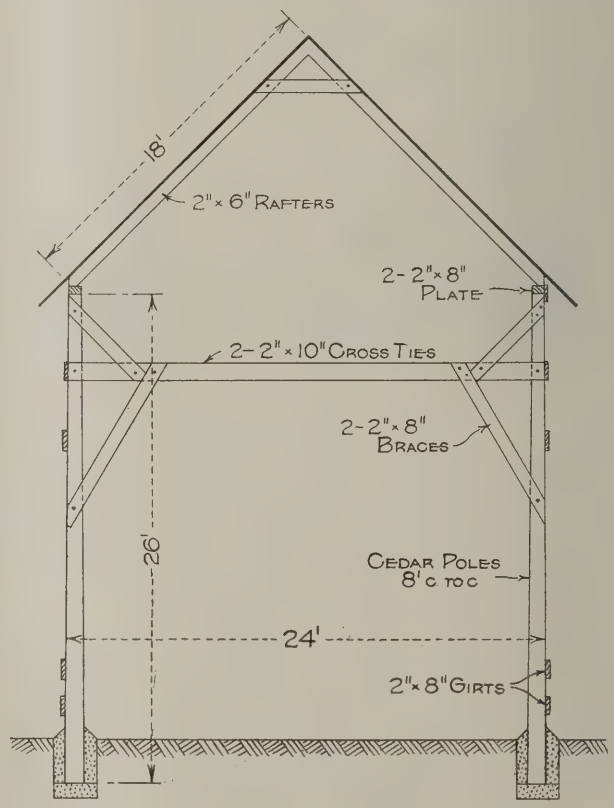


Fig. 5—Vertical Cross Section of the Hay Shed

The doors are wide and there is plenty of room, so that the manure spreader can be driven around inside and the sheds cleaned. The center portion of the barn is supported by 6 x 6-in. posts, each of which are 24 ft. long. These are set on concrete or stone piers every 8 ft. and are well braced

at the top. A cross section of the building is shown in Fig. 8.

For a barn of this nature the following materials will be required:

45 barrels cement.
3 dozen anchors, ¾ in. x 18 in.
832 ft. 2 x 6 plates and sills.
864 ft. 6 x 6, 24 ft. center posts.
650 ft. 2 x 6, 6 ft. studding.
900 ft. 2 x 6, 24 ft. rafters.
800 ft. 2 x 6, 16 ft. rafters.
600 ft. 2 x 8, 12 ft. plates and braces.
1000 ft. 1 x 8, 16 ft. manger slats.
2000 ft. siding lumber.
4000 ft. roof sheathing.
36 M. cedar shingles.

In this connection it may not be without interest to refer a little in detail to the very convenien device for preserving farmyard manures, which is to be found on Willow Lawn Farm at Waverly, Iowa. It is merely a frame shed with open sides and concrete base, as illustrated in Fig. 9. The floors are of water-tight concrete and the walls are built to a height of 3 ft. of the same material.

The pit is 18 ft. wide and 64 ft. long. The posts and the general plan can be used to any size of pit on any farm. The cross section Fig. 10, affords a fair idea of the construction of the pit.

The posts, it should be remarked, are set into cast iron post sockets, which are imbedded into the concrete walls. The roof is well braced and tied to prevent racking.



Fig. 6—A Popular Style of Cattle Feeding Barn

The bill of materials here given will prove of interest:

45 bbls. cement for floor and walls.
20 yd. clean coarse sharp sand.
35 yd. well-graded gravel.
18 cast iron post holders.
25 pieces 6 x 6 in. x 12 ft. for posts.
18 pieces 2 x 8 in. x 18 ft. for planked girders.
36 pieces 4 x 4 in. x 6 ft. for braces.
36 pieces 1 x 6 in. x 6 ft. for roof props.
66 pieces 2 x 4 in. x 12 ft. for rafters.
16 pieces 1 x 8 in. x 16 ft. for troughs.
2000 ft. B. M. for roof board.

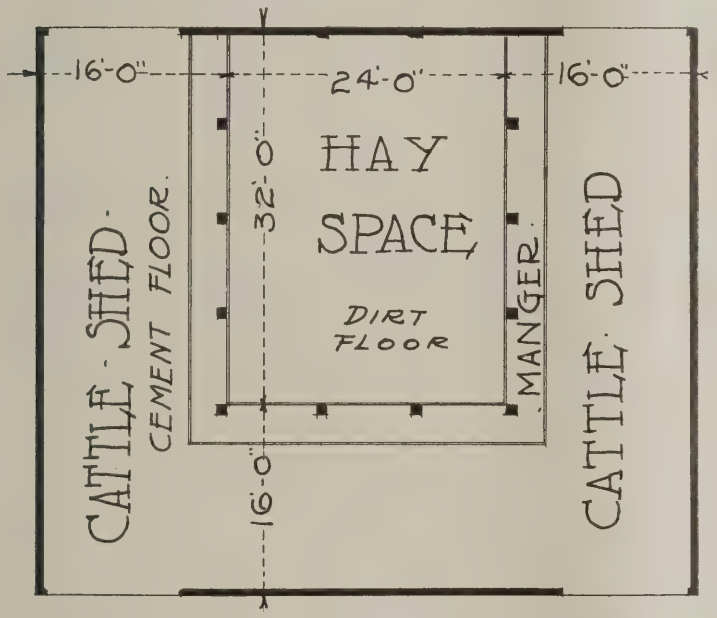


Fig. 7—Floor Plan Showing Central Hay Space

are 6 x 6 in., placed 8 ft. on centers. The rafters are 2 x 4 in., placed 24 in. on centers. The roof props are 1 x 6 in., placed 4 ft. on centers. The cross ties are 2 x 8 in., the braces are 4 x 4 in., and the plates are made up of three pieces of 2 x 8 in. stuff.

The litter carrier from the stables dumps its load into the pit and returns to the barn empty. The position of the carrier track is shown on Fig. 11. Wash water from the barn drains and gutter empties into a cistern, and is then pumped up into the troughs and spread out for the manure heaped in the pit. This moisture, along with that which leaks through the roof boards, keeps the pile moist. That is the secret of keeping it right. Moisture excludes air and destructive bacteria,

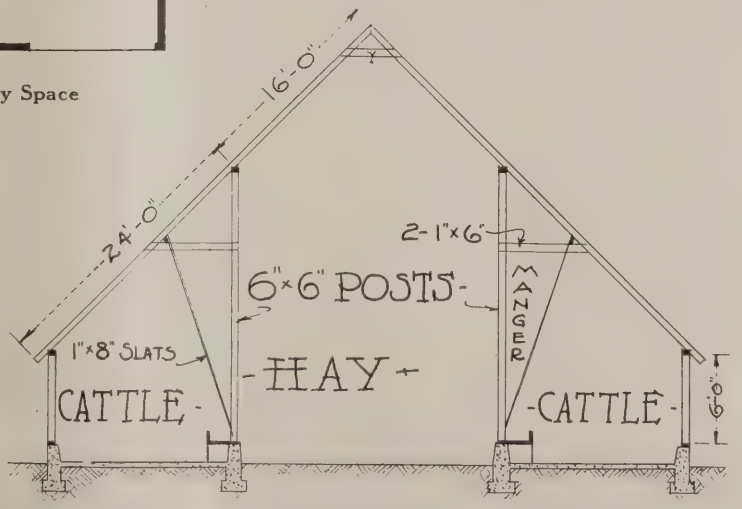


Fig. 8—Vertical Cross Section of Cattle Feeding Barn

Many Houses Needed

The Committee on Housing of the Council of National Defense, appointed Oct. 9, to investigate and report upon the extent of the housing problem in connection with workers employed on Government contracts and the relation of that problem to the output of war materials, has submitted its findings to the Council.

The testimony and records obtained by the committee clearly indicate that with few exceptions the Government contracts for ships, guns, ammunition, and other war materials, have thus far been made with little or no Government provision for the housing necessities incident to a rapid and large increase of labor.



Fig. 9—A Covered Manure Pit for the Farm

The situation may be well instanced by one New England manufacturing city where there exists a distinct community problem. In that city 16 concerns are engaged upon war contracts, and it was disclosed to the committee on housing that nearly 10,000 additional men, for whom there now exists practically no living quarters, will be required by Jan. 1 if the plants in question are to run to their full capacity.

Notwithstanding the existence of such cases as cited above, the committee on housing deprecates any exaggeration as to the extent of the existing housing problem. As a matter of fact, many communities and individual industries are now taking care of their own housing requirements. Others, where there is serious congestion, are preparing to do so; but there are a number which will need financial assistance in house building if full production capacity is to be had.

In general, it is the opinion of the committee on housing that the existing emergency demands immediate action, and is convinced that under proper safeguards the Government should give quick financial aid to such industries or communities as can clearly demonstrate their right to relief. In this regard it is suggested that any aid which may be given by the Government should preferably be rendered in the form of loans at a low rate of interest. Some loss to the Government may be reasonably expected, but the expenditure necessary to give relief is negligible when measured by the loss incident to delay in the execution of the vast war orders already placed.

The committee on housing particularly emphasizes the conviction that any Government aid for industrial housing should be considered as a war measure, and be confined to cases where restriction of output of war materials would otherwise occur.

The committee on housing of the Council is composed of Otto M. Eidlitz, chairman, contracting builder, New York City; Gertrude Beeks Easley, chairman, welfare department, National Civic Federation; William J. Spencer, secretary, building trades department, American Federation of Labor; C. G. Du Bois, comptroller, American Telephone & Telegraph Co.; Theodore Robinson, vice-president, Illinois Steel Co., Chicago.

The State of New South Wales, Australia, is rich in quarries of building stones within easy access to the chief commercial center, Sydney. There are quarries of marble, granite, and of light-yellowish sandstone suitable for building purposes. This yellowish stone is used extensively for building purposes, and for tombstones. Granite is used very little, and chiefly as surbases of the newer business buildings. There are very few buildings of white marble, and the public buildings are nearly all of Australian sandstone.

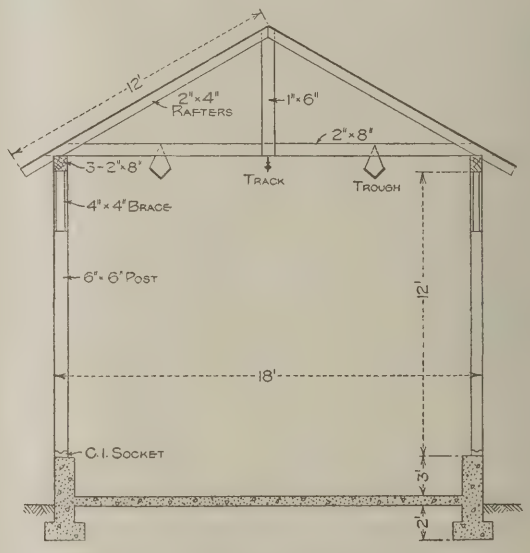


Fig. 10—A Vertical Cross Section

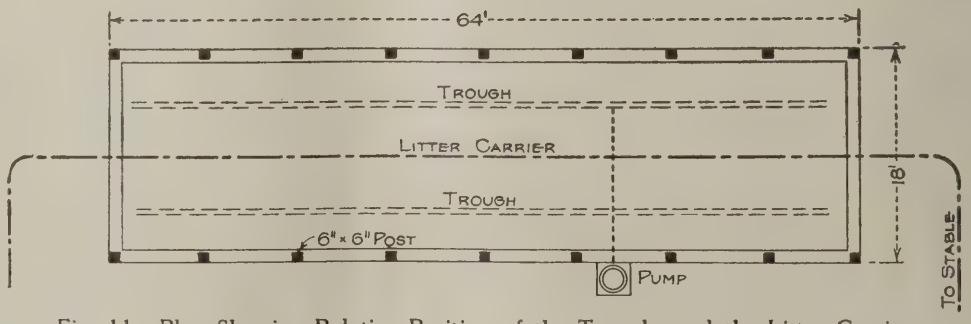


Fig. 11—Plan Showing Relative Position of the Troughs and the Litter Carrier

Filling and Finishing Various Woods

Suggestions Which the Practical Builder and the Cabinet Maker Will Appreciate

BEECH may be stained walnut, cherry or mahogany, with fine effects, and there is a quarter-sawed effect that is handsome. There is also a curly variety. When this wood is finished natural the final coat of varnish should be left in full gloss; but if stained the last coat should be dulled. The stain may be in water, in spirit, or be a chemical stain in oil, some preferring one thing, some another. It is a very close-grained wood, and owing to its delicate markings is hard to stain successfully, as they are so easily obscured. If you should use a pigment stain, wipe off at once, and wipe carefully. With proper care you may get a fine job in this way. But the transparent stain is to be preferred.

Finishing Cherry

Cherry is an ideal wood for finishing, in all respects. But to get the best results you need to make it very smooth and free from dust. Each tiny speck of dust or dirt will loom up like a wart on the finely-finished surface. Rubbing the finish removes this feature, but to my mind the gloss finish looks the best. Cherry is seldom finished in the natural, though it is a very handsome wood that way, but stain makes it even handsomer. Burnt sienna is a good color for it, while aniline stain, particularly Bismarck brown, makes a beautiful finish, though it is less durable than the earth pigment. Some vegetable stains, like alkanet root or dragon's blood, give a fine stain also.

The use of water color on cherry involves the danger of laps. Should this occur, simply wet the laps on their edges with clear water, also the adjoining parts, then go ahead with the stain. Apply the stain freely, but avoid air bubbles.

The Use of Shellac

Some finishers prefer paste filler for cherry, though it is a close-grained wood, but the vast majority use only a surfacer, usually shellac. If you care to apply a paste filler, here is a good formula: Best gilder's whiting, 5-lbs.; plaster of paris, 2-lbs.; dry burnt sienna, 1½-oz.; dry Venetian red, 1-oz.; boiled oil, 1-qt.; turpentine, 1-pt.; brown japan, 1-pt. Pulverized silica may be used instead of whiting and plaster, but the whiting enters into the wood better than silica, while plaster furnishes the desired element of coarseness.

Cypress is perhaps the most difficult wood to finish. In the first place, it is difficult to dry it perfectly, but once it is dry the problem of finishing is not so great. In fact, it is the undry wood that offers the difficulty. Then the application of water stain causes a great deal of grain-raising.

Treatment of Cypress

In general, the treatment of this wood is the same as for birch and cherry. Shellac it, sandpaper smooth, follow with two or three more coats of shellac, with the sandpapering on each coat, finishing with varnish, rubbed, or flatting varnish. Never apply any oil to this wood. It has a sort of sap in some places that no shellac will hold back, and no paint or stain dry over. A coat of benzol might be beneficial. Some use a stain mixer with strong vinegar, following with a coat of shellac, then a coat of varnish. If water stain is used, first apply a coat of shellac or gelatin glue size. The turpentine stain may give less thouble than water stain.

Staining Cypress to Imitate Oak

Cypress is sometimes used for making imitation oak of the mission color and finish, selecting the straight-grained variety of cypress for the purpose. Make the stain from japan dropblack, with a little rose pink; mix with inside varnish to a thickish paste, thinning out with turpentine to form the stain. Strain through cheesecloth. The color may be lightened or darkened as desired. To secure a greenish effect omit the rose pink and use dark chrome green for the black. Imitation antique oak may be made by using a stain composed of two parts of Vandyke brown and one part of raw umber, adding also a little dropblack; all these colors are to be japan. Mix to a paste with varnish and thin out with turpentine.

Finishing Elm

Elm is one of the furniture-maker's friends. It has a rather large pore, but is easier to fill than oak and ash. Its one fault is its whiskers, or fuzzy spots, which catch the color or filler and cause an uneven, muddy effect. Here is a finishing method for this wood that was a great favorite with a friend of mine; it is sure to give satisfaction. Instead of filling with a paste filler use this: First, prepare a liquid surfacer by mixing up some pulverized silica filler of antique oak shade, medium, thinning with turpentine (not benzine, which evaporates too quickly, causing brush marks). Mix together equal parts of this filler and liquid filler, then stir in as much turpentine as you have of the combine fillers. Stir the whole. Now make any desired change of color by adding either burnt sienna or burnt umber, or both.

Apply this filler with a flat-chiseled, soft-bristled

*A. Ashmun Kelly in the Wood-Worker.

brush, about 2½-in. wide. Apply the filler carefully, spreading it uniformly and evenly, and wipe out the edges. Lay it off as in a staining job; when this is done, leave it to become flat, which will take about twenty minutes, but do not rub it with sandpaper until twelve hours have elapsed. Use No. 0 paper, make the surface quite smooth, then apply the primer. Let this stand for twelve hours, then sandpaper smooth, following with a coat of varnish, which may either be rubbed to a dull finish or be left in the gloss, as desired.

Much elm will contain sap spots, which will show up in the finish if not corrected. This may be done by staining the spots to correspond with the general color. This is done after the work has been filled and sandpapered; take a piece of soft cotton rag and a cup of water stain, using either burnt umber or Vandyke brown.

Making Damp Cellars Waterproof

The Use of Grout Paint—Proportions of the Plaster Coat—Its Thickness

BUILDERS have experienced a great deal of trouble at times in rendering cellars damp-proof and not a little discussion of the subject has appeared in the columns of this journal. Various have been the remedies suggested for overcoming the difficulty, and among the latest is that given out in leaflet form by the Sandusky Cement Company, which is of special value to the trade by reason of its source. The information has to do with rendering damp basements dry or leaky cisterns water-tight, and reads as follows:

Damp-proofing a Finished Cellar

"When the necessary precaution has not been taken during construction to damp-proof a basement or to make a cistern water-tight, permanent waterproofing results can be secured by following these simple directions:

"If already plastered and it has not adhered to the wall in places, which can be determined by striking with a hammer and noting a "dead" sound, remove the old plaster. Roughen the surface to be treated by chipping with a cold chisel or similar instrument, and rake brick joints to a depth of ¾ in., to obtain a bond for the new plaster coat; then clean with a heavy wire or stiff broom to remove all dirt and dust. Clean the walls and floor thoroughly by scrubbing with a good stiff brush and water, or preferably wash the surface with a solution of 1 part hydrochloric acid to 10 parts water, allowing this to remain about 10 minutes, and then thoroughly rinse off the surface with clear water (with a hose under good pressure) to remove the chemical and loose particles resulting from the action of the acid.

The Use of Grout

"To the cleaned saturated surface (or after wetting the surface thoroughly) apply a coating of neat cement and water, to which 2 per cent of Medusa Waterproofing has been added, mixing to the consistency of thick cream. This grout can be applied with an ordinary brush, but should not be used very far in advance of the plastering, so that the grout paint will not have an opportunity to harden before the plaster is applied.

"The plaster coat should consist of 1 part Portland cement, 1½ parts clean sharp sand, and 2 lb. Medusa waterproofing powder or paste to 100 lb. cement. The waterproofing powder should be thoroughly mixed dry with the dry cement before the addition of sand and water, or Medusa waterproofing paste should be mixed with the water used.

Thickness of the Mortar

"Apply the plastering mortar ½ in. to ¾ in. thick on the walls and about 2 in. thick over the floor. Special care should be taken to bond the wall and floor coatings, so as to make the waterproofed work continuous over the entire surface.

"No more mortar should be mixed than can be used within 30 minutes. It can be applied with a steel trowel, and should be thoroughly worked at once with a wood float to make it as dense as possible. Final finishing may be done with a steel trowel, trowelling for not more than one minute and then leaving undisturbed. Excessive trowelling will result in checking.

How to Relieve the Pressure

"If there is a continual seepage through the walls, holes must be bored in the walls and tubes or small gas pipes inserted to concentrate the flow of water and relieve the pressure while the plaster coat is being applied. Caulk around pipes with oakum. Drainage pipes should remain open until the waterproofed coat has thoroughly set and is capable of resisting the pressure by its own adhesive strength, after which remove pipes and plug holes with cork or wood and cover with waterproofed cement plaster.

"If the water pressure is exceedingly great, it will be necessary to sink sumps on the exterior of the walls to a depth below the basement floor level, and keep sumps going continually until the plaster has thoroughly set.

"The finished surface must be protected from too rapid drying out, by keeping moist for at least a week to allow it to thoroughly harden and to prevent hair-cracks."

Some Echoes of the Noon Hour—IV

A Question of Stair Construction—Device for Holding Doors While Being Fitted

EDWARD H. CRUSSELL

"YOU fellows have been making a lot of fun about that dictionary I bought," began Bliss, as he entrenched himself behind his opened lunch box and commenced the attack, "but I want to tell you that I got my money's worth out of it to-day, and that ginger-whiskered book agent doesn't owe me a cent."

He bit the salient angle off a sandwich while he paused for comments, but as all the other members of the gang were too busy with what they were engaged upon to make any reply, he presently continued: "Ever since old Pompus, the architect, found fault with my work on those stairs I've been wanting to get back at him and to-day I managed it. He came puffing up onto the top floor, like a war tank going into action, and after looking all round for the Old Man, he fixes me with his eagle eye and barks out: 'What is the status of the skylight?'



"It's in status quo"

"'What's what?' said I.

"'The status! status!! What is the status of the skylight?'

"'Oh, yes,' said I, 'the status of the skylight. The skylight is in *status quo*.' I thought he was going to have a fit."

"That's the place where you laugh, fellows," explained the Kid, who had been part way through high school. "*Status quo* is a Latin speech from the back of Bliss' dictionary and means, the same as it is, or as it was before."

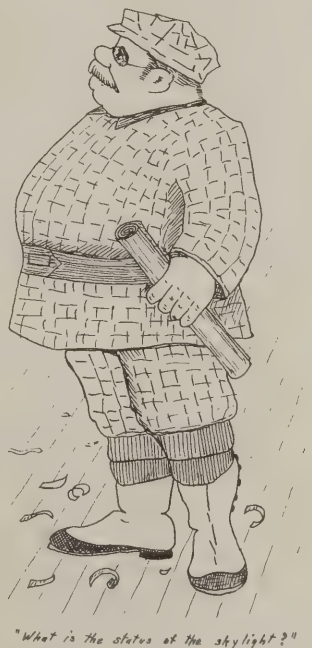
It was the custom of the gang to greet all of Bliss' stories with silence and sober faces, but the Kid's explanation, taken with their knowledge of previous events, was too much for them and they broke out into a general laugh.

Some time before there had been a squabble about the building of the rear stairs. These, according to the detail drawing, were to be arranged as in Fig. 7. Bliss, after consulting the foreman, arranged them as in Fig. 8, explaining afterward that he had never seen stair treads placed flush with the risers, and had merely thought it another mistake of the architect's. This explanation being given in the architect's presence, ended all diplomatic relations and the stairs had to be torn down and rebuilt.

The boss took sides with his men and warned the architect that all future work would be executed exactly according to drawings, in consequence of which he (the architect) had better make a careful check of all said drawings.

A few days later, the architect brought along the detail drawings for an elliptical skylight, that was to go in the roof above the main stairs and was somewhat discomfited when the foreman pointed out that, although a certain color of glass for a skylight was mentioned in the specifications, no skylight was shown, or mentioned, on either the plans, elevations, or sections; he further added, that if one was put in, he thought it would be an "extra." All this was common knowledge in the gang, and the idea of the architect toiling up to the top floor to be met there with a common woodbutcher spouting dictionary Latin, was what caused the laugh.

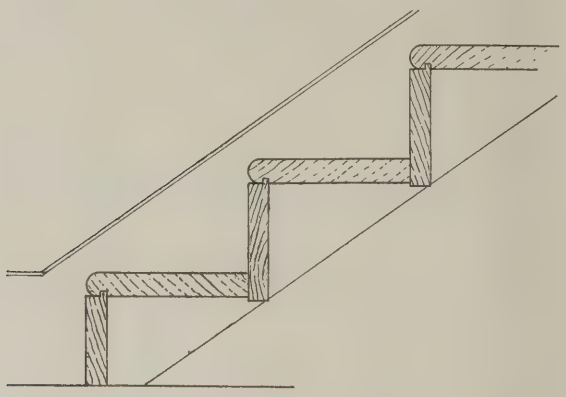
"It doesn't seem as funny to me as it does to you fellows," commented Old George. "I've seen all kinds of workmen, and most kinds of architects in my time, and I've never yet seen one of either kind that wasn't liable to make a mistake. One of the best things I've learned is, that it's always well to be lenient with the other fellow's mistakes, because you never can tell how soon you may wish him to be lenient with yours. If our friend the architect had been willing to overlook the mistake in the stairs, he would have found it easier to arrange matters concerning the skylight, and I bet he has wished many a time since then that he had done so. He's not a bad old chap in his way; I've known him longer than you have! he's getting old, and like all of us old fellows he wants humoring. If there had been any likelihood of anyone losing his job



"What is the status of the skylight?"

on account of those stairs he wouldn't have said half so much about them, and if any fellow had lost his job, he would undoubtedly have begged it back again for him; I've known him to do that very thing."

"All of that may be true," said Bliss, with a self-satisfied grin, "but I'll bet he don't yell 'Status! status!!' at me again for some time."



Echoes of the Noon Hour—IV—Fig. 7—Elevation Showing How the Stairs Were Drawn

The foreman appeared at this juncture, and in order to change the subject and at the same time avoid a break in the conversation, Shorty greeted him with: "Say, boss, what was the rest of that lecture on efficiency you were giving us the other day? I remember you said that you had more to tell us, and I want to see if you can't catch some of these fellows the same way you caught me."

"As I remember it," said the foreman, "you caught yourself, which makes a difference. I'd hate to have any of you think that I go snooping around taking notes of your faults and misdeeds, in order that I may give you a lecture about them. As a matter of fact, a foreman can usually see more than he is given credit for seeing, both of things deserving censure and of things deserving praise, and it is a mistake to assume that because he says nothing about them, he must necessarily be either blind, or lacking in observation. This matter was drawn to my attention by an old foreman of mine many years ago. I was fitting and hanging doors at the time, and to hold the doors while planing them, I used a piece of 1 x 4-in. stuff with a notch cut in it, as wide as the thickness of the door. This piece of wood was cut slightly longer than the width of the doorway and was pressed in between the jambs.

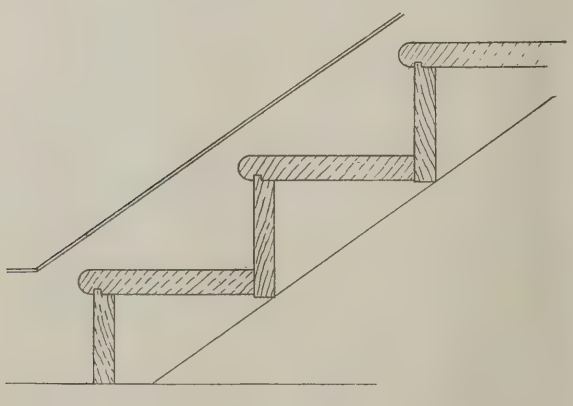


Fig. 8—Elevation Showing the Way Bliss Built Them

"I expect that most of you have used the scheme yourselves and understand what I mean, but I'll draw you a sketch of it to make sure. (See Fig. 9.) The end of the door is slipped into the notch, which will hold it upright while it is planed.

"I had been using this method for the greater part of the day when the foreman, on one of his rounds, said to me: 'Look here, why don't you put a scrap of wood between the end of that 1 x 4 and the jambs? Every door that you've fitted today has a mark on each jamb where you've rammed that contrivance in between them.' And then he went on: 'Don't think that I don't notice these things, and don't think any other foreman or boss you work for won't notice them; he'll notice every thing you do, good or bad, and credit you accordingly, whether he mentions the matter to you or not.'

"It was this latter remark that impressed the incident on my memory, but it was not until some time after I had been made foreman myself, that I realized how absolutely right my old foreman was.

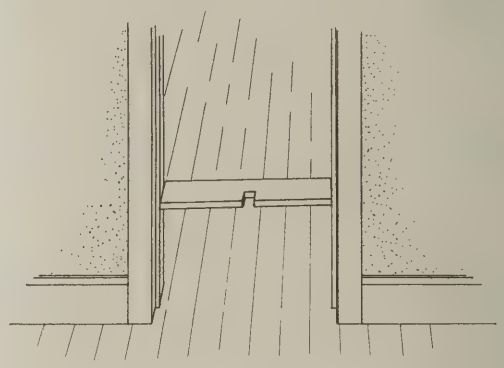


Fig. 9—The Foreman's Contrivance for Holding a Door While Planing It

"And now, by special request, I'll tell of a lack of efficiency that I have noticed in the marking and sawing of lumber. Perhaps the most common fault of all in this respect, is where the workman rakes his pencil along the square three or four times instead of once, wasting both time and pencil and making the mark worse instead of better. One stroke of the pencil is all that is needed, and when I see a man using more, I generally surmise that he is somewhat in doubt as to what he should do next, and is using up time in this manner until he is able to figure it out. I have seen a man square a line round all four sides of a 2 x 4 when fitting studding, marking two or three times for each side, while the man in the room next to him was cutting the studding without squaring it at all and doing just as good a job.

"Cutting square without a mark is only a matter of practice, and is something every woodworker should strive to learn. For rough work, such as roof boards and under-floors, a square is not needed for any width of lumber, and all such finish

lumber as ceiling or flooring, 4 in. or less in width, can be cut without the aid of a square.

"Some men have a habit of laying their rule across a board and drawing a line by means of it after guessing it into position; others will use the back of a straight saw for the same purpose. If you must have a line, use a square for marking it; time is lost by using a makeshift.

"In many cases the thumb nail may be used instead of a pencil mark to indicate a measurement; it is quicker, and the chances for error are less.

"These are small matters in themselves; it's only when the foreman sees a man climb down off the roof to get a square to mark a piece of 6 in. sheathing, or watches him search through all his pockets for a pencil with which to mark one short length of studding, that they become noticeable.

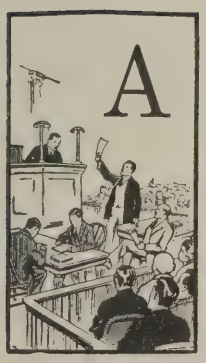
"One of the most common, and one of the most exasperating faults on finishing work, is that in which the workman cuts a length of molding in two pieces, because he is not competent to take a correct measurement and fit it in one. It is no unusual thing to find the picture molding in a room 12 ft. or 13 ft. square, with an extra joint in each length, because the genius that fitted it thought it easier to fit two joints than one; and picture molding is not the only finish that is butchered in this way."

The foreman took out his watch at this point, and Bliss broke in with: "Well, boss, I don't know if it is because of what your old foreman said to you or not, but there is one thing sure, your powers of observation are working alright. I suppose every one of us has been guilty, at some time or other, of some of the things you have mentioned: I know I have; moreover, I was foolish enough to suppose that no one noticed it. I'll be more careful in future."

Some Noteworthy Court Decisions

Architects Presumed to Know Building Laws—Holdings on Defective Plans and Subcontractors' Rights

By A. L. H. Street



AN architect is not entitled to recover compensation for preparing plans and specifications for a building of a character forbidden by law. This important point is declared by the Supreme Court of Pennsylvania in the recent case of Medoff vs. Fisher et al.

Plaintiff sued to enforce payment for services in preparing plans and specifications for a building to be used as a moving picture theater, and partly for stores and dwelling apartments, with a public bathhouse in the basement. He was denied the right to recover, because the building would infringe the statutes of Pennsylvania, which forbid occupation of any portion of a building in cities of the first class as a dwelling or tenement house, or department store, where the building is designed to seat five hundred persons or more as a moving picture theater, and which provide that a building seating more than five hundred persons shall not be used for any other purpose.

The court holds that all men are supposed to know the law, and that one who holds himself out to the public as an architect is particularly charged with knowledge of the regulations and restrictions governing the erection and use of buildings.

"We must assume both the plaintiff and defendants knew that the uses to which the latter contemplated putting the proposed structure were forbidden under a criminal penalty by the statutes of Pennsylvania," reads the opinion in the case. "Thus, it may be seen, we have the plain case of three men, the defendants, intending to do a forbidden thing, employing a fourth, the plaintiff, to assist them in making plans to carry out their unlawful purpose—in other words, a combination which could be indicted as a criminal conspiracy. Of course, no contracts or engagements entered into under such circumstances will be enforced at law."

Architect's Liability Concerning Plans

An architect is not liable for injuries sustained in consequence of defects in plans prepared by him, if he has exercised a reasonable degree of skill and care in his work. Nor, in any event, can he be held liable for injury flowing from collapse of a building due to defective construction, in the absence of proof that his plans were followed. These two points were declared the other day by the Michigan Supreme Court in the case of Bayne vs. Everham et al.

This suit was brought against the owner of a garage, which collapsed in the course of construction, and the architect and contractor engaged in the work. Damages were sought by plaintiff as administrator for death of a workman who was killed in the accident while discharging his duties as a carpenter employed on the structure.

The court finds that no cause of action was proved against the architect, within the following principles of law applicable to the case:

"In Corpus Juris, vol. 5, p. 269, the rule is stated as follows: 'In the preparation of plans and specifications, the architect must possess and exercise the care and skill of those ordinarily skilled in the business; if he

does so, he is not liable for faults of construction resulting from defects in plans, as his undertaking does not imply or guarantee a perfect plan or a satisfactory result, it being considered enough that the architect himself is not the cause of any failure, and there is no implied promise that miscalculations may not occur.'

"This court has held that the responsibility of an architect does not differ from that of a lawyer or physician. When he possesses the requisite skill and knowledge, and in the exercise thereof has used his best judgment, he has done all that the law requires. The architect is not a warrantor of his plans and specifications. The result may show a mistake or defect, although he may have exercised the reasonable skill required."

Supporting its decision on one phase of the case, the Michigan court refers to a New York case—Lake vs. McElfatrick—wherein damages were sought against an architect for defective plans and specifications furnished by him for the erection of a theater building. The sole defect complained of was the proscenium arch. This was designed to rest upon stone skewbacks. Their office was to furnish a firm foundation for the arch, and distribute its thrust over a large area of the abutments. Instead of using stone skewbacks, brick was substituted. The trial court permitted plaintiff to recover, and the New York Supreme Court affirmed the judgment. The Court of Appeals, however, held that the suit should have been dismissed upon the ground of a failure to prove that the arch was constructed in substantial compliance with the plans and specifications furnished by the defendant.

When the Architect's Decision Is Binding

Under a contract for the building of a dormitory, a sub-contract was entered into for the installation of fireproof material, the supervising architect approving the plans submitted by the sub-contractor. The sub-contract specified that unsatisfactory work or materials should be replaced on proving to be unsatisfactory to the architect, and contained the usual provision making the architect's decision upon disputed matters binding on both parties. The specifications called for a certain test to be applied to concrete floors after the floors should have been in place for forty-five days. In constructing the floors, the sub-contractor spaced the joists in claimed compliance with the plans approved by the architect, and refused to comply with his order to reinforce the joists. In litigation growing out of this and other disputes arising under the sub-contract, the sub-contractor relied on the architect's approval of the plans and on the provision for test above mentioned. But the United States Circuit Court of Appeals, Eight Circuit, holds that the architect's requirement for reinforcement was regular, saying:

"The preliminary approval of the plans was not the only permissible use of the architect's discretion, for the contract allowed the condemnation of 'work done or materials provided.' Neither was the judgment of the architect required to be based on any particular tests. The amount of deflection of the floor joints when the test load was applied to them, and the probable effect of that deflection upon the terazzo floors to be laid upon them, when such floors should be put to the strain of use, justified the architect in condemning them and in avoiding the delay that would ensue if the floors were finished before a test was made." (Berger Manufacturing Co. vs. Huggins.)

In the same case it is decided that the sub-contractor could not avoid responsibility for delay in furnishing certain materials because the delay was caused by another to whom the manufacture of the materials was sublet by the sub-contractor.

The Question of Interest

A question of the contractor's right to claim interest against the sub-contractor was also involved in the suit. It grew out of the fact that the sub-contractor filed a mechanic's lien against the building on the parties failing to arrive at a settlement. When the lien was filed the owner exercised a statutory right to withhold money due the principal contractor. The lien was subsequently disallowed, but there was nothing to indicate that the sub-contractor had not acted in good faith in filing the lien or that he did not honestly believe that he was entitled to settlement according to his view of his rights. Under these circumstances the court holds that the contractor was not entitled to recover from the sub-contractor the value of the use of the money so held up by the owner pending the lien proceedings.

Opportunities for Skilled Workers in the Air Service, U. S. Army

There is room on the ground behind the lines abroad for capable, skilled American workers as the air fighters need the backing of such men in order to keep air planes ready for instant and constant service, to construct and maintain the airdromes for housing the planes and quartering the men, also to bring up supplies, ammunition, etc. Squadrons have been and are now being formed for service abroad. Picked men are being enrolled from various classes of skilled workers, these men to be given special training according to their vocation in work required in the air service. They will get actual practice work on airplane motors, trucks, airdrome construction and everything that will be done on the other side.

The chief signal officer of the War Department has just issued an announcement enumerating the kinds of skilled workers which are needed for the air service and among the different classes of special interest to readers of the Building Age may be mentioned the following:

Carpenters,
Electricians,
Cabinet Makers,
Draftsmen,
Metal workers,
Rope riggers,
Plumbers,
Painters,
Molders,
Pattern Makers,
Bricklayers,
Boat Makers,
Instrument repair men,
Coppersmiths,
Blacksmiths,

Applicants must be physically sound and from 18 to 40 years of age. Enlistment blanks can be obtained from the Volunteer Bureau, 119 E Street N. E., Washington, D. C.

After enlistment the men will be sent to a camp for several weeks of military training and special instruction in the work required.

How a Section of a Lumber Mill Was Transformed Into an Attractive Office



How Wall Board May be Advantageously Used in Industrial Buildings

Some of the Possibilities for the Use of Wall Board Work in Factories

By Joseph A. Poesl



N office is illustrated on this page as a specimen of what can be accomplished with wall board in mills and factories. This office in particular happens to be a section of a lumber mill which has been transformed, with the aid of wall board, into a pleasant and up-to-date general office.

The average layman would, in all probability, have difficulty in determining just why this office is more attractive than others. He could hardly be expected to know that the well-proportioned panels and their symmetrical arrangement are contributing factors; he would surely not think of attributing a share of the credit to the clever treatment of the ceiling in real and false beams of several different sizes. The fact that even the transom bars are at the same distance from the floor as the horizontal decorative strip, and therefore have something to do with bringing about the general effect that is so pleasing, would probably never enter his mind.

No wonder, then, that carpenters and builders become enthusiastic over wall board, once having done work with it and obtained results anywhere near those of the office illustrated. As they go on using it they, of course, become more familiar with its peculiarities; they learn that by correctly applying it according to a carefully thought-out scheme of paneling they are guaranteed satisfactory results every time. Other knowledge concerning wall board is acquired by them in time, such as how to put it on the quickest, how to handle it easiest, and so on; all of which tend to heighten their regard for it as an indispensable building material.

Another development of the builder in his acquaintance with wall board, which is interesting, is his insatiable desire to put it to new and unheard-

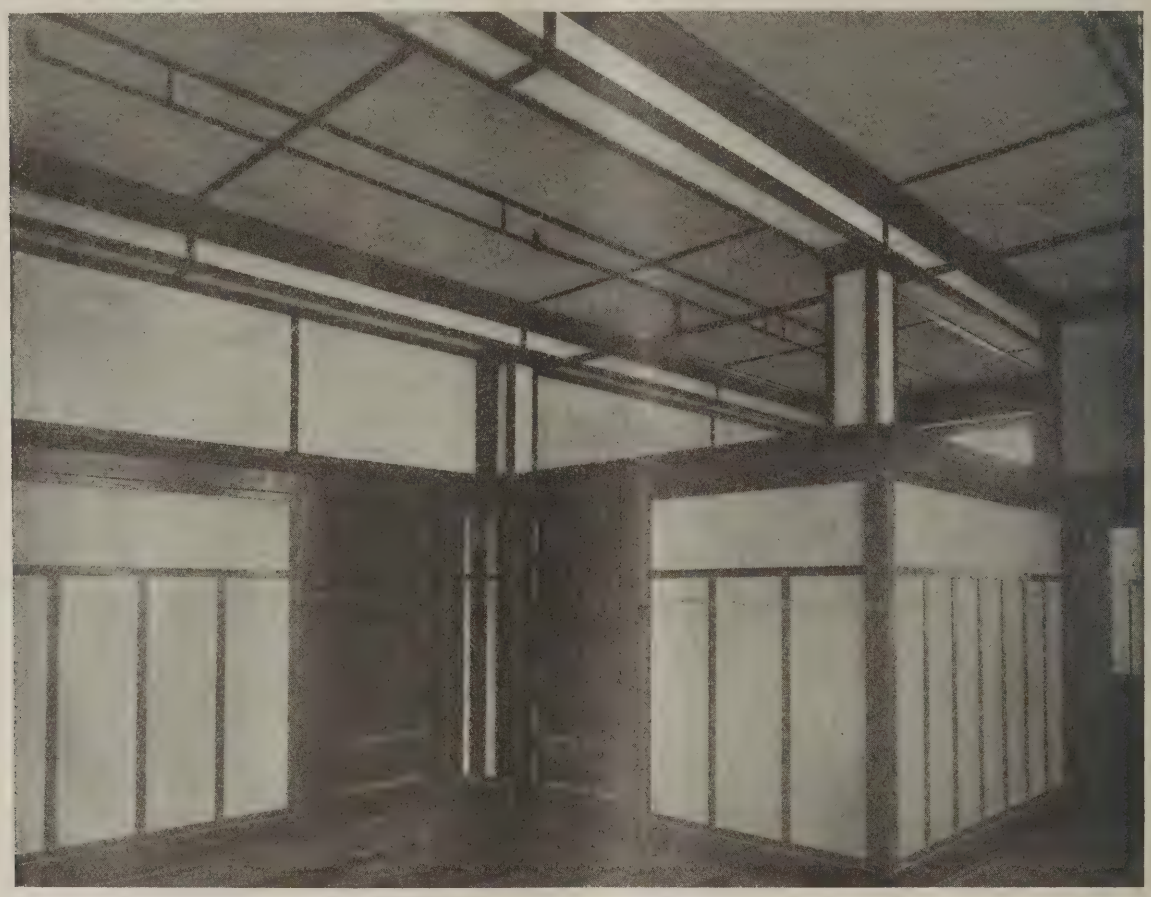
of uses. A certain builder went so far as to cover the foundation trenches for a mill he was erecting with wall board panels in order to keep out the rain. He figured that the cost of the board would be amply justified if it prevented the sides from collapsing. He had learned from experience that it is more expensive to redig a collapsed trench than a new one. After the rain he had the panels laid aside to dry out, and then stored them away for another similar emergency.

And thus we find stage scenery and settings made of it; we see it used for "forms" in the making of small concrete shapes; we see it placed on concrete roofs, newly laid, in cold weather, to assist in protecting the concrete from being touched by frost.

This meritorious trait of the builder led him to investigate the industrial field as one for the use of wall board; and, indeed, it is a profitable field, to his liking, as he found.

The walls and ceilings of a great many factories, mills, etc., could be advantageously finished with wall board. Those light-absorbing beams in the majority of them could be effectively concealed with it. Thereby better lighted rooms would be obtained, and efficiency experts tell us well-lighted quarters are necessary for workmen to produce the best results. Besides, less paint is required for wall board than for a wood surface of many rafters and beams. The same may be said of walls. If both ceiling and walls are finished with wall board, the place will be kept warmer in winter and cooler in summer as a result, due to the well-known insulating qualities it possesses. Then, too, it is obvious that a factory finished with wall board is more sanitary than it would be without it. This all merely goes to prove that wall board can make a factory interior more attractive, more comfortable, better lighted, and more economically operated as far as maintenance is concerned.

A conception of the wide adaptability of wall board may be gained from the following list of mills, factories, shops, and the like, of greatly different characters, in which it is particularly advantageous. They are given at random:



Another Example of the Admirable Use of Wall Board in a Factory Building

Textile mills,	Jewelry factories,
Shoe factories,	Printing shops,
Electroplating plants,	Cooperage factories,
Chemical laboratories,	Sign painting shops,
Furniture factories,	Trunk makers,
Canneries,	Tailoring shops.

To the foregoing must also be added the numerous and miscellaneous class of factories doing light manufacturing. In those where painting and varnishing are done wall board can be utilized very beneficially to prevent dust from getting into the room and to maintain an even temperature. Because it does these things, several manufacturers of automobiles and automobile bodies are now using it for drying rooms. When it is used for this purpose no decorative strips are placed over the

panel joints; they are for decorative purposes only, as the name implies.

Wall board can be applied very readily in buildings of the slow-burning type of construction. The panels can be nailed directly to the walls and ceiling between the heavy structural timbers without furring strips. In other wooden buildings more or less furring and extra framing will have to be resorted to.

Wall Board in the Foundry, Machine Shop, etc.

On first thought, one would think there existed no place in a foundry, steel mill, or machine shop where wall board could be used to advantage. But when one considers that in every one of them there is a superintendent's office and perhaps several little offices for the foremen, the prospect for wall-board work here becomes more inviting.

I have been in a factory superintendent's office which had not only the walls and ceiling covered with wall board, but the floor as well. He claimed that it was much better than the concrete floor underneath. It was warmer, more quiet, and looked better. He happened to have it painted in harmony with the wall decoration. It is necessary, however, when using wall board for this purpose, to repaint it just as soon as the paint on the board wears through.

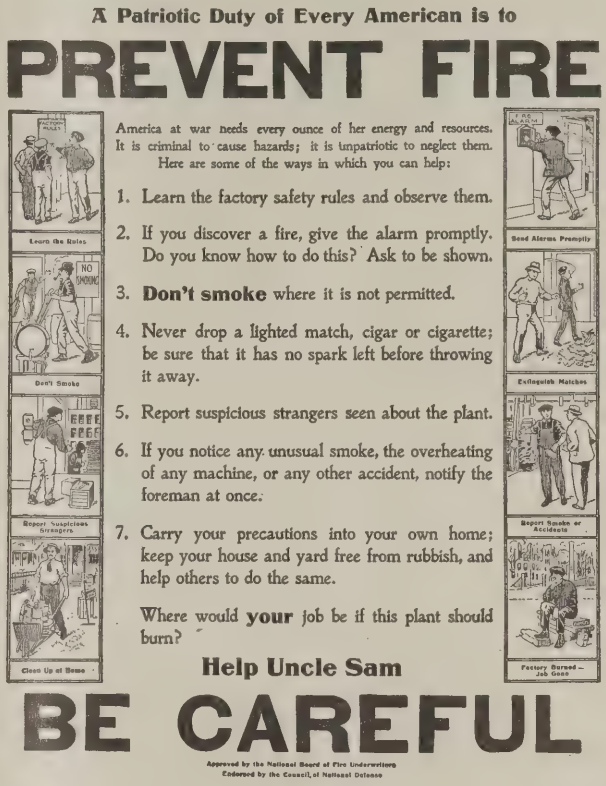
Screens Made of Wall Board

In another of these offices I discovered a peculiar shield or screen placed before the radiator. It was built in the shape of a shallow box, as long and wide as the radiator, and about 6 inches deep. One side was open, and the box rested on the long, narrow edge upon two legs, which also held it at the proper height. The radiator was one of these flat wall kind, and the screen was simply moved over it from the side so as to cover it on all sides but the back. The entire affair was made of wall board fastened to suitable framing. Its purpose was to prevent the heat from radiating directly upon those in the office whose desks could not be conveniently located elsewhere on account of the smallness of the office.

Stock rooms, locker rooms, rest rooms and lavatories are other necessary rooms which can be made of wall board in any type of factory building. In fact, wherever a partition is required in a factory, wall board is suitable.

An Example of the Fine Results Possible With Careful Workmanship

The second illustration accompanying this article is another interesting example of wall-board work in the factory. It is evident that the one shown is to be used for light manufacturing purposes. (When the photograph was taken it was not yet occupied.) To me it is extremely interesting, as it is indicative of the fine results possible from careful workmanship, both in planning and execution. The girders and posts are covered rather well, and the walls and ceiling are treated in a pleasing manner, yet conforming to the structural features. As evidence of the latter note the sprinkler pipe running between the two girders. It is exactly below the decorative strip, not an inch or more to either side of it. In one corner the stock room is partitioned off, and at the extreme right can be seen the door leading into the office.



Training for Men in Building Trades

For the purpose of assisting so far as possible in supplying skilled men for the building trades, and in order that those already in the trades may be better trained, the Builders and Traders' Exchange at Grand Rapids, Mich., is lending its active support to the establishment of a high-grade building trades division in the Y. M. C. A. Evening Vocational School in that city. Courses of study for the winter season, which began Oct. 15, included architectural drawing, plan reading and estimating, heating and ventilating, sheet-metal drawing, and the Portland Cement Association's course in concrete construction.

A Concrete Commercial Building with Glass Front

In connection with a seven-story reinforced concrete commecial building being erected in San Francisco is the unique feature of the entire front being of glass. There are about 18 rows of reversible plate glass windows extending clear across the front, giving the facade the appearance of an 18-story building. In the present case, the columns are set back from the front about 3 ft. or more, thus permitting the entire front to be of glass. The plans were drawn by Willis Polk & Company.

BUILDING AGE

FORMERLY CARPENTRY AND BUILDING
(Founded in 1879 by David Williams)

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Index to reading matter will be found on page 17 of the advertising section.

DECEMBER, 1917

To Advance New York Building Interests

Growing out of the recent agitation caused by the heavy falling off in building construction in New York City there has just been formed among builders, contractors, material dealers and credit men an organization having for its objects the advancement and general welfare of the building industry of the metropolis. The work of the organization, we understand, is to be of a very wide scope and will cover a field not heretofore attempted in a serious way by individuals and associations connected with building operations. The new organization will not, however, interfere in any way with individual organizations, but rather co-operate with them and to this end the membership will include representatives from various organizations whose interests are in specific branches of the building industry, but in no way supplanting them. It is felt by those having the matter in hand that through co-operation with similar bodies in other cities and with the national, state and city governments, greatly improved conditions affecting labor, mortgage loans, building materials, transportation and other subjects relating to the industry may be obtained and possibly legislation suggested which will prove beneficial. In furthering the movement a committee was recently appointed to perfect the organization here early referred to, and it is devoutly to be hoped that developments will be such as to stimulate building operations in and about the Metropolis of the East.

Our Cover Design

The colored design which is shown upon the front cover of this issue of the paper is the main entrance of a stucco-coated house in Oak Park, one of the many attractive suburbs of the city of Chicago. The position of the entrance doorway is somewhat unusual in that it is located in an angle of the building, the windows at the right being those of the living room, while those at the left belong to the dining room. Passing through the front door the visitor enters the reception hall on the opposite side of which in an angle and directly facing the entrance is a coat closet. From the reception hall one may enter the library, the living room, the dining room and the stair hall. The entire arrangement and exterior treatment are cleverly handled and reflect great credit upon the architect.

Exhibition of the Architectural League

According to the announcement which has just been made by the Architectural League of New York, its thirty-third annual exhibition will be held as usual in the building of the American Fine Arts Society, and judging from the program which has been prepared, should be of more than ordinary interest. The exhibition, which will continue from February 3 to 23, is intended to be illustrative of architecture and allied fine arts and will consist of drawings and models of proposed or executed work in structural, decorative and landscape architecture; sketches and finished examples of decorative painting; sketches, models and finished examples of decorative and monumental sculpture; drawings and models of works in the decorative arts, together with photographs of executed work in any of the above mentioned branches. In connection with the exhibition will be several competitions held under the auspices of the League, one of these being for the Henry O. Avery Prize for sculpture and another for a special prize of $300, the latter being for the best design submitted by an architect, sculptor and mural painter in collaboration. The subject is to

be an assembly room or auditorium in an Army or Navy Y. M. C. A. building of a training camp, the competition, however, to be limited to the treatment of the platform or stage and adjacent space. The platform is to be within an area 25 ft. in depth and 40 ft. in width. The subject representing the combined work of the architect, sculptor and painter is to be a model in color rendered at a scale ½ in. to the foot. The League established in 1909 a medal in painting as well as a medal in sculpture, and in 1915 a medal in architecture, and these medals are offered annually in connection with the exhibition of the League. They are intended to encourage the submission of works of merit, to raise thereby the standard of the League's exhibition, and the medals are therefore given only in recognition of superiority in work actually submitted and placed. The medal of honor presented by the New York Chapter of the American Institute of Architects to designers of buildings represented in the exhibition of the Architectural League was discontinued in 1915. The talent represented in these annual exhibitions is of a high order and the displays always attract a most interested and critical audience from far and wide.

Contractors' and Builders' Show

A bulletin has recently been issued by L. F. Mead, general manager of the National Exhibition Company, announcing that the name of the exhibition to be held Feb. 6 to 13 in the Coliseum in Chicago, Ill., will be known as the Contractors' and Builders' Show instead of the Chicago Cement Machinery and Building Equipment Show, as previously stated. The new name will be used for the reason that it not only is more descriptive of what is to be exhibited, but appeals directly to the class of people who will attend. It is also thought that the adoption of a shorter and more appropriate and comprehensive name will meet with the approval of all exhibitors.

Announcement is made that C. E. Hoyt and E. C. Hall are now associated with the National Exhibition Company. Mr. Hoyt has been secretary and manager of the annual foundry and machine tool shows for a number of years and his experience with all phases of management of an exhibition, in many respects like the coming show, renders him exceptionally valuable to organization.

Mr. Hall, who has had years of experience with safety, foundry, educational and other trade conventions, is well fitted to bring in the new conventions which are wanted in Chicago during the period of the coming Contractors' and Builders' Show and to co-ordinate the work of the convention and the exhibition.

Up to the time of going to press with this issue the following associations had been booked to hold their conventions during the week of the show:

Illinois Lumber & Builders' Supply Dealers' Association.
National Association of Sand & Gravel Producers.
National Builders' Supply Association.
Central Association of Lumber, Sash & Door Salesmen.
American Concrete Institute.
American Concrete Pipe Association.
American Association of Engineers.

In addition there are several other associations which may possibly decide to hold their meetings at that time.

Coming Convention of Brick Makers

It has been officially announced by Secretary Theodore A. Randall that the thirty-second annual convention of the National Brick Manufacturers' Association and allied organizations will be held in the city of Indianapolis, Ind., Feb. 3 to 9, 1918. The headquarters will be at the Claypool Hotel, which is famous as a convention hotel and has excellent facilities for the comfort of its guests. As in former years, it is anticipated that all allied associations will meet at the same time and suitable accommodations will be afforded for committee rooms, meeting places, etc.

In his announcement, Secretary Randall calls attention to the fact that "never before was there a more urgent need for exchange of views on the various questions which are now perplexing the wisest and most experienced manufacturers in the land. Every member is expected to be present and do his bit toward meeting the new conditions in a manner most apt to spell the largest measure of success during the following season."

Handbook for Architects and Builders

There has just been issued from the press the twentieth annual edition of the "Handbook for Architects and Builders"—the official publication of the Illinois Society of Architects. It is a valuable volume of 448 pages, measuring 6 x 9 in. and bound in flexible covers. It has been compiled with a great deal of care and constitutes an excellent reference book for achitects, builders and engineers. The present edition is regarded as even better than the one sent out a year ago. It has been edited by Emery Stanford Hall and is copyrighted by H. L. Palmer, the financial secretary of the society.

Among the many things to be found within the covers of the book are the canons of professional ethics of the society, a list of licensed architects and their addresses, the code of practice in architects' offices, which will be found of much suggestive value; the revised Building Ordinance, with many of the vague sections illustrated by drawings; all the special rulings of the Building Department, with notations at the beginning of

each section to which the rulings apply; schedule of charges for architects as recommended by the Illinois Society of Architects; standard measurement for excavation and concrete work; standard specifications for structural steel; strength of materials; specifications for plain concrete floors; formula for heating and ventilation; sections of the Sanitary Code of interest to architects; flat slab construction and formula therefor; Code of Plumbers and Plumbing; revised basis for pricing extra work; standard specifications for southern yellow pine timbers; wind bracing in steel frame construction as well as various other matters of interest and value to the architect and builder in his everyday work.

Competition in $6,000 Houses

One of the features of the Real Estate and Building Show, which is to be held in the city of Columbus, Ohio, Jan. 21 to 30, will be a competition conducted under the direction of the Columbus Chapter of the American Institute of Architects, in cooperation with the Columbus Real Estate Board and the Builders' and Traders' Exchange. The competition is open to architects everywhere, and plans will be received up to and on Wednesday, Dec. 26, of the present year.

The problem is an inexpensive but attractive suburban house of the detached type, supposedly built on an interior lot of rectangular form with a street frontage of 50 ft. and a depth of 115 ft., the land being level and without trees or other natural beauty. The materials employed in the general construction of the house are to be at the discretion of the competitor and provision shall be made for no less than 6 rooms and bath, these embracing living room, dining room—or a combination of these two rooms—kitchen, three bedrooms and a bathroom. There will also be a basement under the entire house.

The cost of the house, exclusive of the land and work of embellishing, shall not exceed $6,000. The cost is given as a basis upon which the size, figured in cubic feet of each house submitted in the competition, must be computed.

The prizes offered aggregate $500, of which $200 is for the design placed first, $125 for the second, $75 for the third, $50 for the fourth, $25 for the fifth, $15 for the sixth and $10 for the seventh design, in order of merit. Honorable mention will be given to designs placed eight to fifteen.

The drawings are to be delivered at the office of Real Estate and Building Show, Arcade Building, Columbus, Ohio.

Oak is said to be one of the most suitable woods for carving, on account of its durability and toughness, without being too hard. Chestnut, American walnut, mahogany and teak are also desirable, while for fine work Italian walnut, lime, sycamore, apple, pear or plum are generally chosen.

A Swiss Châlet with Basement Garage

(*Continued from page* 673)

bathroom, besides the customary fixtures, has a wall medicine case and a corner cabinet of shelves and drawers for linen; and each bedroom and the den has a closet.

Both the living room and the dining room are finished with a wood cornice, and the walls of the latter possess a paneled wainscot and a plate shelf. The woodwork of these two rooms and the hall is of California redwood, waxed, but otherwise left in possession of its natural color. In the den it is of pine, treated with Johnson & Son's wood dyes in such a manner as to produce a sort of Old English oak effect; and elsewhere, throughout both the main and second floors, it consists of pine, enameled white. The living-room fireplace, set in an inglenook 3 ft. deep, is constructed of Batchelder handmade tile, of dull buff and blue shades; and the slightly elevated hearth, while floored mainly with buff-colored cement, is bordered and edged with corresponding tile.

It will be noted that glass or French doors are extensively used, and constitute a truly enhancing feature of the home. The use of windows is unusually liberal, and the large second-floor sleeping room, with windows in three of its walls, is made to constitute what is almost a screened sleeping porch. The windows are largely of the casement kind, designed to swing outward, and equipped with rods to hold them in the desired position. The screens are fastened on rollers, similar to the ordinary window shade, and hence may be rolled up or down as desired.

Oak flooring is used in the living room, main-floor hall, dining room and den, beech in the main-floor bedroom, and pine throughout the remainder of the house. The floors of the kitchen and two bathrooms are covered with linoleum.

The house is heated by hot-air furnace, with registers in every room and all hallways, the piping being concealed in the partitions and covered with asbestos in the ordinary way. The plumbing is complete and modern, and there is an automatic water heater. Electric wiring and gas connections complete the equipment.

This attractive and practical hillside châlet is located in a picturesquely hilly portion of Los Angeles, Cal., and was constructed at a total cost of approximately $5,600, including the necessary excavating and all equipments.

It was erected from plans prepared by Arthur L. Acker, architect, 182 East Vernon Street, Los Angeles, Cal., and was built under the supervision of Charles H. Richmond, a building contractor, who is also the owner, the exact location being 1931 Franklin Circle, in the city named.

Boring a hole 1½ in. in diameter along the axis of a column is said to reduce the danger of checking.

The Science of Handrailing



A Description by an Expert, with Rules for Applying the Steel Square

By C. F. Stark

FOR some time it has been a matter of speculation as to when certain and definite rules for applying the steel square to the problems of handrailing would become known and adopted in practice. In the present article it is intended to set forth two of these rules which have at length become disclosed. As most every one in the trade is aware, the two fundamental problems of the science are concerned respectively with the ellipse upon which the mold is based; and the bevels which direct the squaring of the wreath-piece. Farther on the two rules will be given by which the steel square deals very effectively with these principal problems.

Preceding their statement, however, it is felt advisable to afford an insight to the principles forming their basis. We shall therefore make a brief study of the ellipse in its relations to a quarter-circle.

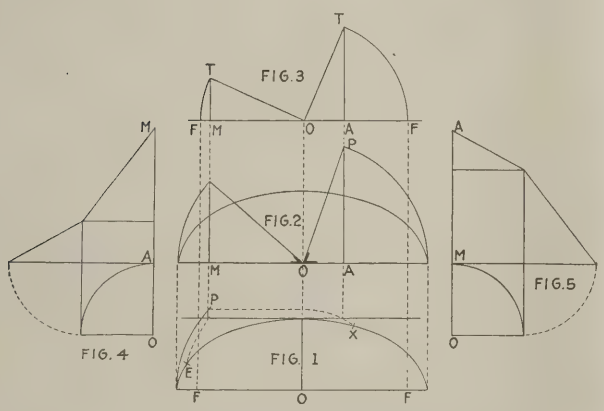
Of the diagrams presented, Fig. 1 deals with a problem of especial interest and value; one that seems to have been generally overlooked in previous investigations. It should be reflected upon that just as a given elevation of the tangents will fix the points in an ellipse where the mold must terminate so conversely will these points, if given, impose certain conditions which the tangents must observe in the elevation. In such a case, however, as we are considering here it is enough if only one termination of the mold be given in the ellipse; for as we shall observe since the other termination can be found from the one given, the tangents are as conditioned in the latter instance as they are in the former.

The semi-ellipse in Fig. 1 is assumed to contain the center line of a required mold concerning which nothing is known about the elevation of tangents. The letter *E* indicates a point which is given as one termination of the mold. It is required to determine the point *X* or the entire extent of the center line.

First with the semi-major-axis as a radius, from center *O*, describe the outer arc to *P*, or farther. Then draw a line, parallel to the major axis, and make it also tangent to the ellipse, as seen.

Again with *O* as center describe another arc from the point *E* to intersect this parallel tangent; and square up through the intersection the short line to *P*. From *P* another parallel is drawn to meet the minor axis produced. The latter, being then taken as a radius from center *O* will describe the arc determining, as seen at *X*, the other end of the mold.

Now it should become evident that from any point of an ellipse, a division of it into four segments is directly possible, each of which will corre-



Figs. 1 to 5—A Deductive Study in Retrogressive Order of the Quadrant in Handrailing

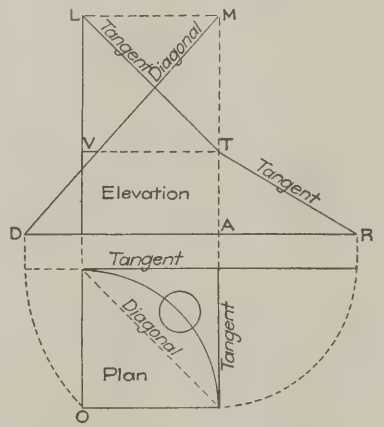


Fig. 6—The Assumed Pitches of the Tangents in Plan and Elevation

Diagrams Illustrating Various Phases of the Subject of Handrailing

spond to a quadrant of the circle over which it may be assumed to lie.

In passing on to the next figure we must note the importance of the two points which are given by the intersections of the dotted arcs and the parallel tangent. In Fig. 2 the lines *MP* and *AP* are squared up through these points. The semi-ellipse is here reproduced to show how the arcs from the ends of the major-axis determine the lengths of these two lines. Then the figure is completed by drawing lines from the center to the points *P, P.* At the center to either hand are seen the bevels which respectively apply at the points *E* and *X* of Fig. 1. Fig. 2 also contains everything requisite to construct the plan and elevation of the tangents.

How Lines Change in their Relation to the Tangents

A moment now is required to notice how the lines *MP* and *AP* change in their relations to the tangents. In Fig. 2 these lines show the lengths respectively which the tangents in the elevation must be made equal to. If, however, arcs are described from the foci, as shown in Fig. 3, these lines become diminished to *MT* and *AT*, and are then equal respectively to the height of a tangent instead of its length.

Our first uncertainty arises as we go to construct the plan and elevation. This is exemplified in Figs. 4 and 5. It is seen there that a stair of either hand may be deduced from the one mold; that the top tangent of the one case is the bottom tangent for the other case. Observe though that either tangent is kept to the same hand in both.

Uncertainties in Constructing Plan and Elevation

For example, in both Fig. 4 and Fig. 5 the height of the left tangent is made equal to *MT;* and the height of the right tangent equal to *AT*. Thus in these latter figures are shown the conditions of plan and elevation which were imposed by the selection of the point *E* in the particular ellipse of Fig. 1.

Here a short digression is entered upon bearing upon the basis whereon the use of the steel square in its problematical capacity may be assumed to rest. Besides giving more assurance in this use of the square it will later help us to perceive the connection between the figures under discussion and the rules which we are presently to deduce from them.

The Steel Square

In the expert use of this tool when it is applied to a line or edge of timber, as the case may be, we observe that the whole figure of a right-angled-triangle becomes instantly determined. Part of the line of application is cut off by the arms of the square, thereby determining the third or longest side, and the two acute angles of the triangle. In the instant determination of any or all of these three properties of the triangle consists the advantage found from the use of the steel square.

In an old demonstration it was shown that two triangles must be equal and similar in all respects when two conditions of equality are observed in each. The first condition is that they each possess an equal angle. The second requires that the two sides containing the equal angle of the one triangle shall be respectively equal to the sides containing the equal angle in the other triangle.

Now our employment of the steel square restricts this demonstration to one class of triangles. The reason will be understood why the square can be associated only with those triangles that contain a right angle. And so it will be evident that the first of the conditions mentioned above is then bound to be observed, since both the square and the triangle contain an equal angle.

There remains, then, in order to produce a second identical triangle, only to see that the measurements taken on the blade and tongue of the square are respectively equal to the sides about the right angle of the given triangle.

Using the Square in Determining the Triangle

Thus, if any problem falls, or can be reduced, as the principal problems of handrailing have been, to this restricted conception of a triangle; then if the two sides containing the right angle be known, an immediate solution of it is seen to be possible, for by means of the steel square we may instantly determine the whole triangle, whence every part of it is at once made known.

Now returning to the diagrams already under consideration, it may be remarked that they exhibit the same form of the science as was introduced to readers of the BUILDING AGE on page 79 of the February issue of the paper. Rules for constructing these diagrams in the regular order were then described.

When the Same Mold Is Used

Here we have in Figs. 4 and 5 plans and elevations of the tangents calling for the same mold. In Figs. 3, *M-A* is equal to the height of both tangents taken together; while *M-T* and *A-T* are respectively equal to the height of left and right tangents. The center *O* is fixed equi-distant from the points *T, T*. Now let two lines be drawn from the center *O* to the points *T, T*, forming the right triangles *OTA* and *OTM*.

With respect to these triangles it is first to be noted that no conclusion can be entertained that is reached by assuming that these triangles are not identical. By construction the hypotenuses *OT, OT* are equal. Hence it is manifest that the squares of the sides *AO* and *AT* of the one triangle must be equal to the squares of the sides *MO* and *MT* of the other.

When a Supposition Leads to a Contradiction

A supposition leading to a contradiction of the equality of these squares must evidently be rejected as false. Now since *MT* and *AT* are equal respectively to the heights of the two tangents, and the line *MA* is equal to their combined height; if we suppose that *AO* be greater than *MT*, it follows that *AT* would then be greater than *MO*.

And then, as a consequence, the squares of *AO* and *AT* would be greater than the squares of *MO*

and *MT*. The supposition taken is seen to involve the contradiction mentioned, hence it must be rejected. Therefore *AO* cannot be greater than *MT*. Conversely it may be shown similarly that *AO* cannot be less than *MT*. Therefore they must be equal. And then it follows necessarily that *AT* must be equal to *MO*.

Thus we have seen that in the two triangles *OTA* and *OTM* the two sides containing the right angle of the one are respectively equal to the two sides containing the right angle of the other. Hence there can be no further doubt that these triangles are identical. And it will not be overlooked now, that in perceiving this identity we have been forced to notice that the sides about the right angle of each triangle are equal respectively to the heights of the tangents.

To conclude our consideration of this figure, suppose the external angle of the steel square to be placed at the corner *M*, with the arms coinciding with *MO* and *MT*, then it is evident that the hypotenuse *OT* would intersect the blade at a measurement equal to the height of one tangent, and the tongue at a measurement equal to the height of the other tangent. And as the hypotenuse *OT* is equal to the exact distance of the foci from center of ellipse, we have the following rule for their determination by the steel square:

Rule 1.—Obtain from the elevation the two measurements of the heights of the tangents. Take one of these measurements on the blade of the square and the other on the tongue. Then applying the square with these measurements to the major-axis-line; if one be kept at the center, the other will give the position of a focus.

Perhaps this is the deepest problem ever rendered adaptable to the steel square.

A second rule, however, will now be deduced which shall enable us to obtain the bevels by the same means.

For this purpose we again become interested in the relations between two triangles and the tangents. The triangles *OPA* and *OPM* are seen at Fig. 2. It was shown in the discussion leading to our first rule that the line *M-A* is divided at *O*, so that the side *AO* must be equal to the height of the left tangent and the side *MO* equal to the height of the right tangent. We have also noted that the sides *MP* and *AP* are equal respectively to their lengths.

Therefore in each triangle the sides about the right angle are equal respectively to the length of one tangent and the height of the other tangent. Note now that in each the joint bevel is contained by a side equal to the height and the side known as the hypotenuse. Then the following rule for obtaining these bevels by aid of the steel square will not be difficult to comprehend.

Rule 2.—Obtain the respective lengths and heights of the two tangents. Then on whichever hand the bevel is to apply, take the length of that tangent on the blade, and the height of the other tangent on the tongue. Then the angle formed by the line of application and by marking along the

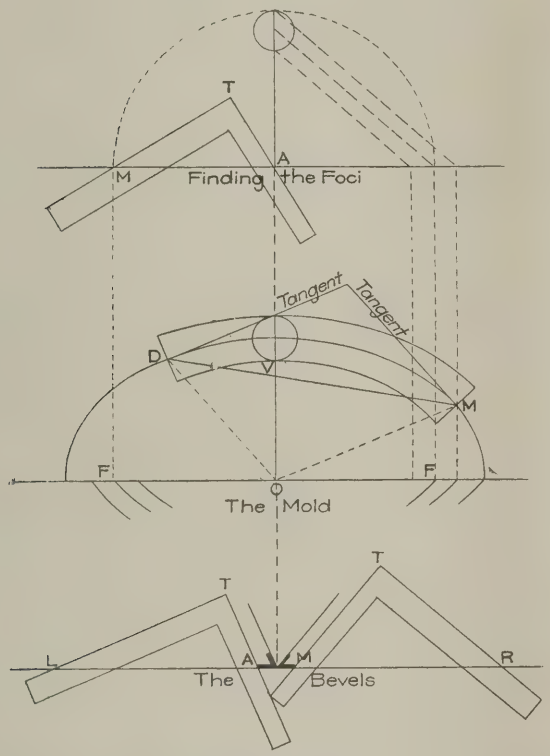


Fig. 7—Showing how the steel square is applied to determine the foci using measurements taken from Fig. 6

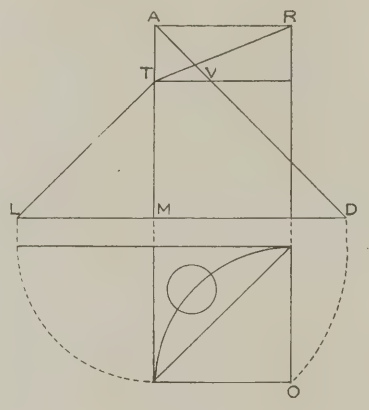
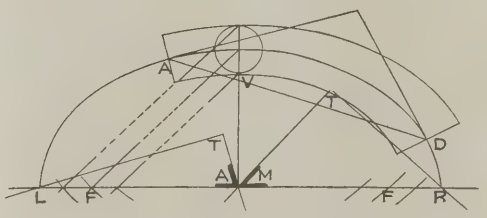


Fig. 8



Figs. 8 and 9—Diagrams illustrating a method slightly different from that in Fig. 6

The Art and Science of Handrailing as Elucidated by Mr. Stark

tongue will show the bevel that is needed.

It may be remarked here that the difficulty encountered in the reduction of these problems to the forms shown in Fig. 2 and Fig. 3, seems to have hindered progress for more than half a century.

How Bevels Are Applied

Having now obtained the rules by which the square may be used for the most rapid and accurate production of face-mold and bevels possible, several additional diagrams are necessary to show their applications, and also how these may vary. Fig. 6 shows assumed pitches of the tangents in elevation, and also their plan. To the right in Fig. 7 the steel square is seen applied to determine the foci, in accordance with Rule 1, using the measurements taken from Fig. 6.

The similar lettering used will render the figures easy to understand. In the intermediate portion of the figure is seen the face-mold which takes a part of the semi-ellipse as its center line.

Determining the Part of the Ellipse Required

These figures also present a very practical method for determining just what part of the ellipse is required. The length of the line over the diagonal, seen in plan, has long been in favor as one of the surest means for fixing the span of the tangents on the mold. In elevation it is generally drawn from the highest point of the top tangent. Here it is drawn to cross the tangent instead. We can realize, when the plan is a quarter circle, that some point in this line must fall upon the minor axis.

Now to determine the requisite part of the ellipse, this point is found and also which part of the line, so divided, lies to the right or the left.

This may be done very simply. When the length of the diagonal is drawn in the elevation to cross the top tangent as seen at *DVM*, then a horizontal drawn from *T*, the meeting point of the tangents, will intersect the diagonal at the point *V*, which will lie on the minor axis and the parts of it will be kept to the same hand on the mold as they appear in the elevation.

Method Followed in Practice

In practice, take the points *D*, *V*, *M*, off on a straight-edge from the elevation, then keeping the point *V* on the minor axis, move the straight-edge until *D* and *M* come into contact with the ellipse.

Again below, the steel square is seen in two positions, having been slid along the line in either direction after marking the bevels according to Rule 2.

Fig. 8 and Fig. 9 illustrate a method slightly different in procedure to the preceding one. Here the tangents selected at random present a greater contrast in pitch. Fig. 8 will not need explanation after Fig. 6 has been considered.

In Fig. 9 two lines are first laid down as the major and minor axis lines. Then at each side of the center the steel square is applied according to Rule 2 and the bevels marked by the tongue.

The outlines of the square are seen in part represented by two sides of each of the triangles *ATL* and *MTR*. Now if the intersections of the blade with the major axis line be marked at the same time as the bevels there is obtained simultaneously the length of the major axis *L-R*. The foci may then be found as they usually are when the major axis is known. And then the mold may be completed as seen in accordance with what has been described previously.

When Shank of Mold Is Necessary

It will have been noticed that in these illustrations the shank part of the mold is omitted. When one is necessary continue the tangent equal to the length decided upon and draw lines parallel to the tangent at the width given.

The diagrams just examined are thought to afford an adequate idea of the advantages attending upon a use of the steel square in the art. We have taken as examples cases which are not of the easiest kind.

It must be admitted though, in regard to cases where the plan is more or less than a quadrant, that it appears extremely improbable that the steel square can ever be found of the same advantage there. These, however, are more rarely met with in practice.

It might be added, though, that by the new method of the tangent system, dispensing with the aid of the square, these latter cases are as easily dealt with as the case of a quadrant was shown to be in a previous number of the paper.

Sub-Contractor vs. General Contractor

In a recent Monthly Letter of the Master Builders' Association of Boston, Secretary William H. Sayward states that one of the constantly recurring complaints received is that of the sub-contractor who feels he has not been or is not being treated fairly by the general contractor and the most frequent complaint is, that the general contractor is not paying to the sub-contractor his proper proportion of payments received by the general contractor from the owner. Secretary Sayward says "that in all too many cases there is undoubtedly justification for this complaint," and he states that the following queries seem pertinent.

"Should final payments by the general contractor to the sub-contractor be deferred until completion of the building?

"Is not the general contractor, in the matter of financial relations with the sub-contractor, simply the trustee for the sub-contractor, and, if so, should not his requisitions on the owner for payments comprehend the payment of the sub-contractor for completed work, letting any deferred payments by the owner only relate to the general contractor's own work?"

These are questions which, it would seem, the readers of the BUILDING AGE might discuss to advantage, and we therefore present them for their consideration, assuring them that the columns of the Correspondence Department are open for a full and free discussion of the matter.

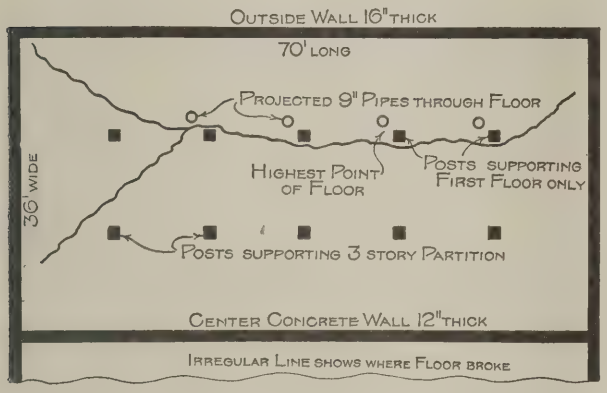
CORRESPONDENCE

A Department Where Those Interested Can Discuss Trade Topics—Every Reader is Invited to Participate

Waterproofing a Cellar

From A. L., Gardner, Mass.—Knowing the attention which has been given in the past to the subject of waterproofing of cellars, I come to the practical readers for information regarding a job of waterproofing which is perhaps somewhat unusual in many of its features.

I have succeeded as far as the walls and one-



Plan of Half of Cellar "A. L." Desires to Waterproof

half of the cellar, which is divided by a 12-in. concrete wall, inside measurement. The other half is 36 x 70 ft. in area with two rows of posts, one row supporting a three-story partition and the other one supporting just the first floor as indicated on the diagram which I submit herewith. There is a head of 5 ft. of water with which I have to contend.

Six weeks after I had completed the job, the water raised the floor 10 in. high in the center and burst the concrete and tarred felt, as indicated by the heavy, irregular line. The first layer of concrete was 12 in. thick and then on top of this was a layer of tarred felt, three-ply, and five moppings of roofing pitch and a top coat of 5 in., but none of that concrete was reinforced. Now I am at a loss what to do, and I therefore come to the Correspondence Department in order to obtain the benefit of the experience of practical readers who have doubtless done work of this kind.

People around here are telling me that there are five springs of water under where the floor is broken and where I intend to place four or five 9-in. pipes, extending them through the floor so as to relieve the pressure on the concrete.

How would it do to place a layer of three-ply tarred felt and five moppings and then a layer of 5 in. of reinforced concrete with ¾-in. bars? Any information which the practical readers furnish will be greatly appreciated and I shall defer further operations on the cellar until I know better what to do.

An Old "Chaplin Jointer" Wanted

From D. P. Barry, Redford, N. Y.—Does any reader know where I can secure one of the old Chaplin 24-in. jointers that were in use twenty years ago? The adjusting fixtures on the present planes were absent on the old ones. There was only the depth lever. The last one I had was bought in a pawnshop and I let the person who was with me have it to accommodate him.

Will any reader who has had experience with hand white-washing machines give me his impressions? I understand that much is claimed for them.

A Concrete Seat for the Lawn

From Albert Marple, Tropico, Cal.—If you are looking for a charming little seat for your lawn which, in addition to being designed along attractive lines is made of materials that are durable in the extreme, possibly the garden feature shown in the accompanying illustration will interest you. It was planned and constructed by a home owner in Los Angeles, Cal., who claims that it is just the place for a moonlight "business meeting."



A Concrete Seat for the Lawn

As may be seen, this seat is made in the form of a half square, having two wings, at right angles to each other, each of which is about 5½

ft. long. The walls are about 4 in. thick, and the cap, running around the top, is the same thickness and about 8 in. in width, while the seat section is about 6 in. thick. Around the back of the seat is a row of 10 x 10-in. green tile, while at the end of each seat section has been built in an ornamental piece of metal. The concrete work has been enhanced by a rough, sanded finish.

This seat is located at the corner of a spacious lawn, the path leading to it consisting of 10 x 10-in. tiling, which harmonize with those in the back of the seat.

Building a Six-Sided Cupola on a Twelve-Hip Roof

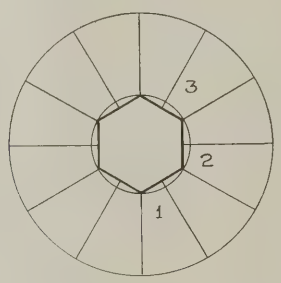
From W. S. W., Hillsboro, Ohio.—In answer to the query of "W. P.," Minier, Ill., which appeared on page 507 of the September issue of the BUILDING AGE, I am sending a plan and elevation of a roof with twelve hips and having a six-sided cupola on top. As I assume the cupola is only for ventilation and will have slats put in the side, the rafters on the main roof can run clear to the point inside the cupola as shown by the dotted lines.

I would sheathe the main roof up under the cupola a little way, then locate the points on six of the hips for the cupola post. To mark these points take a pole or rod and mark the length *a-b* on it, then go round and mark every other hip; then get the length *a-c* on the rod and go around and mark the other six hips.

Now cut pieces and nail them on the sheathing clear around the roof as shown at *d* and *e*, then when the cupola frame is up, you can cut three cornered pieces of siding and nail to these strips until you get above the point *f*, then the siding will run clear across from one post to the other. It will be seen from this that the cupola will be sort of scalloped around the bottom.

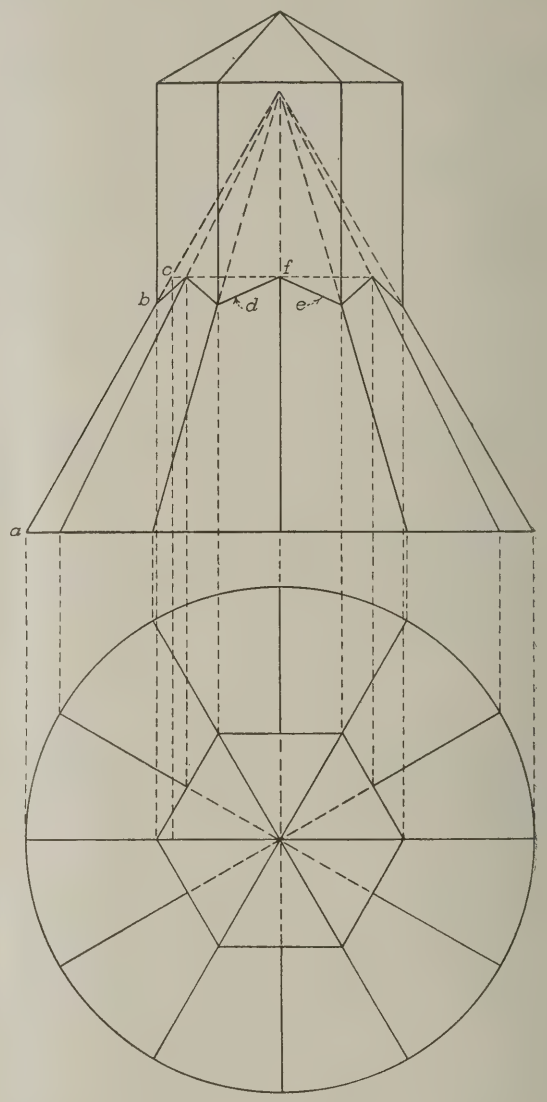
This may not be the pitch the correspondent will use but that does not matter if he works it out according to this principle, for he can use any size or pitch desired and he will find the points the same way.

If the above does not give "W. P." the information he wants and he will state his case more clearly, perhaps I can help him further.



Method Suggested by "D. P. B."

From D. P. B., Redford, New York. — If "W. P.," Minier, Ill., will study the little sketch shown herewith, he will have no trouble with his cupola. He will see that half of the twelve hip rafters will intersect with the angles of the six-sided part. The rest will intersect in the center of the sides of the hexagon. One, two, three, etc., will hit the hexagon a little higher than at the angles.



Plan Described by "W. S. W."

Building a Six-Sided Cupola on a Twelve-Hip Roof—Methods Suggested by Two Correspondents

Heating Water in a Swimming Pool

From L. B., Florida.—We have a swimming-pool job, and would like whatever information we can obtain on heating this pool and on the heating system proper. The pool is about 40 x 80 ft., and is supplied by a flowing 4-in. artesian well which flows into the pool. We would like to know if the water can be heated before it enters the pool or after it is in the pool, and which would be the most satisfactory and cheapest way. The water

has only to be heated enough to take the chill off it.

Answer.—There are many methods of heating the water for swimming pools, the method to be employed depending entirely on the facilities in the form of other steam or heating equipment in the building. Of course, the water may be heated while in the pool by injecting live steam, or it may be heated before being admitted to the pool, depending on conditions.

Regardless of the method employed, the same quantity of heat will have to be provided to warm the swimming-pool water in each instance. The depth of the pool, the temperature of the cold water from the well, the warm-water temperature desired, are not given. These will, therefore, have to be assumed for this instance. Say the pool has an average depth of 6 ft., then 6 x 40 x 80 ft. is 19,200 cu. ft., and at 62½ lb. the water weighs 1,200,000 lb. Considering that the 4 in. well has a discharge of 1000 lb. of water per minute, it will deliver to the pool 60 x 1000, or about 60,000 lb. per hour. As the swimming pool requires 1,200,000 lb. for filling, it will take 1,200,000 ÷ 60,000, or 20 hours, to completely fill the tank. If the well water is 60 deg. when delivered, it should be heated to about 80 deg., which means a difference or temperature raise of 20 deg.

Taking these assumptions as representing the actual conditions, the computation for the heating requirement is as follows: There are 60,000 lb. of water to be heated 20 deg. in an hour. Then 60,000 x 20 = 1,200,000 B.t.u. This amount of heat will therefore have to be supplied from the system of heating used, in order to adequately warm the water. It does not matter whether coal, steam, gas or oil is used as the heating medium, the total heat required remains the same.

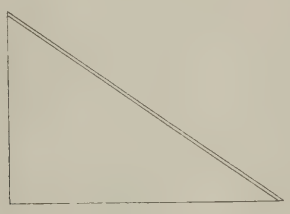


Fig. 2

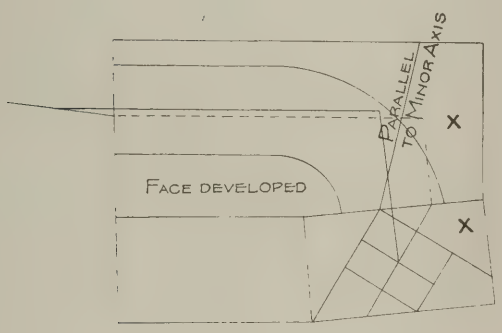


Fig. 1

Getting Out Handrail Wreath with the Band Saw

From James Bruce, Wanganui, New Zealand.—In the June issue of the BUILDING AGE "W. W." asked how to get out handrail wreaths with the band saw, and if not too late I will tell him how we do the job in our shop. We get out our face mold and twist bevels in the usual way. We take our stuff and make the joints, apply the twist bevels and draw the square section of the rail as shown in Fig. 1. From the corner of the square section we draw a line parallel to the minor axis—a level line—(both tangents are pitched), and cut off the block marked X in Fig. 1 to this line and the top of the square section. This has a double advantage of reducing the height of the cut and making a seat for the piece.

Now take a piece of stuff and shoot to the twist bevel for the shank and cut to the pitch of the shank tangent, as shown in Fig. 2. Fix this anywhere inside of the cut parallel to the tangent and, of course, up to the level line.

Now turn the block over and make the face mold on the block and you are ready to cut the sides of the wreath. Fig. 3 shows the job ready for sawing.

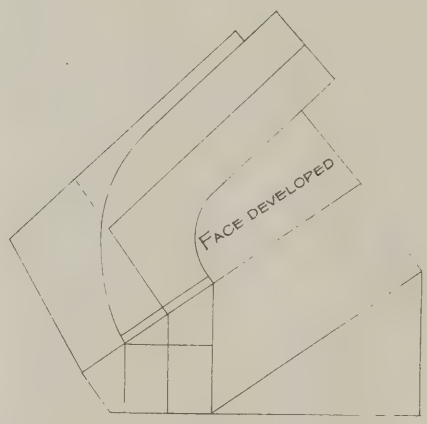


Fig. 3

Sketches Accompanying Letter of Mr. Bruce Describing His Method of Getting Out Handrail Wreath with the Band Saw

If the job is too high for the saw, the shank can be cut up to the spring line by tilting the piece to the twist bevel for the shank and the curve cut as already rigged up. When the sides are cut, the line of the top and bottom of the wreath are marked on the inside and the shanks are cut up to where the nosing begins. Now put a mark on the bench to show the line of the teeth of the saw and draw radial lines on the face of the stuff and keep the teeth on the radials. This requires a good bit of judgment.

I usually take a first cut wide of the mark and see how it looks for a guide for the final cut. The wreath requires very little doing to it before it is ready for molding.

I am sorry that I am not a photographer, as I

would have made a mold and sent a picture of the various stages had I been able, but I hope the sketches will explain the method so that readers in the United States will understand the method which prevails here.

In the July issue of the paper, Morris Williams says he considers the methods of getting out wreaths with the band saw as of little use. I do not think he has given the subject the consideration it deserves. I can assure him that while the ramp is within the compass of the saw, it is a very great saving of time and labor. In the shop where I work we recently did a job which had 60 wreathed pieces in it. Hand rail, capping, string and panel mould and every single piece was backed and bellied by the band saw and a great deal of the top and bottom taken off. A number of the pieces were given to the carver direct from the saw. The stairs were all quarter-spaced landing. Even when you get out the wreath pieces cut square through the plank, it is quicker and easier to band saw the side to the bevel and is well worth the trouble.

Some Phases of Roof Framing

From Eyvind Bergdal, Thane, Alaska.—In reference to the article on roof framing by W. S. Wilkin in the October number of Building Age, I would say that it gives the right means of attaining the wrong end.

I believe it is a pretty well established rule—anyhow, it ought to be—that **all common rafters and jack rafters should always be placed square with the plate,** except in very extraordinary cir-

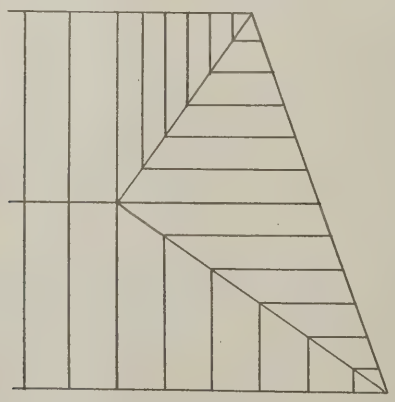


Fig. 1—Showing Spacing of the Rafters

cumstances. If this rule be observed, the framing of roofs to cover any polygon may be fairly easily done by anyone who understands the principle on which all steel square science is based—that of measuring angles and distances with the proportional lengths of the two lines forming the right angle of a right triangle.

In his method of framing a hip roof on a building that has one end out of square, that is, at an oblique angle with the sides, Mr. Wilkin places the rafters on that end parallel with the side walls, as shown in Fig. 1, apparently for no other reason than that they would properly be placed thus if the end were square. This method of framing the hip is unsatisfactory for the following reasons:

The jacks of the hip must be spaced closer than those of one side of the main roof, and those of the other side still closer, as shown in Fig. 1,

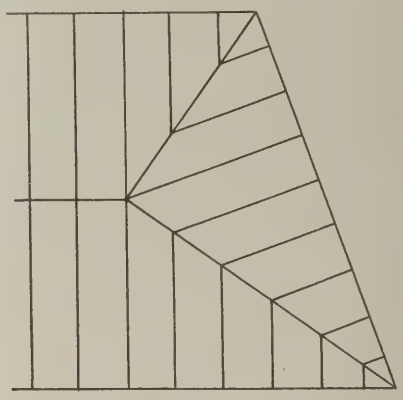


Fig. 2—Showing How All Jacks May Be Evenly Spaced

where on one side they are spaced about twice as far apart as they are on the other side. They may be spaced properly if one disregard their pairing, but I doubt if anyone would recommend that.

Framing is greatly complicated, as each jack has its length and cuts different from those of its mate.

As the top edges of the rafters on the hip do not lie in the same plane as the roof sheathing they must be backed if a fit be wanted. One might tilt the rafters to one side till the top edge would fit against the sheathing, but that would further complicate the framing and also weaken the roof.

Further, if it be desired to leave the rafters bare under the eaves it makes an unsightly job when they are not square with the plate.

By placing the rafters of the hip as shown in Fig. 2 we avoid all these troubles. All jacks may be spaced evenly, and each pair will be of the same length and have the same cuts, except for being right and left. Also, they will fit against the sheathing without being backed.

New Theater for the Bronx, New York

A short time ago plans were filed for a new theater building to be erected at the corner of Fordham Road and Valentine Avenue, in the Borough of the Bronx, New York, in accordance with plans prepared by William H. McElfatrick, the well-known theater architect, the estimated cost being placed at $350,000. The theater will be three stories in height, with a seating capacity of 3000 persons and will also contain stores and offices. It will be owned by the B. F. Keith interests.

The first iron nails made in this country were hammered into shape at Cumberland, R. I., in 1777.



Fourteen Different Kinds of Chimney Trouble

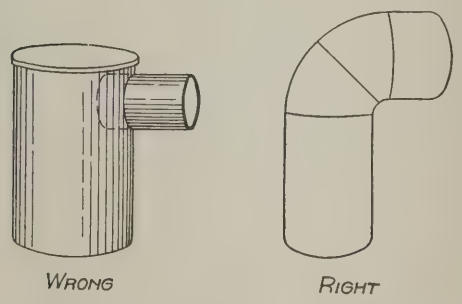
By C. C. W. Peck

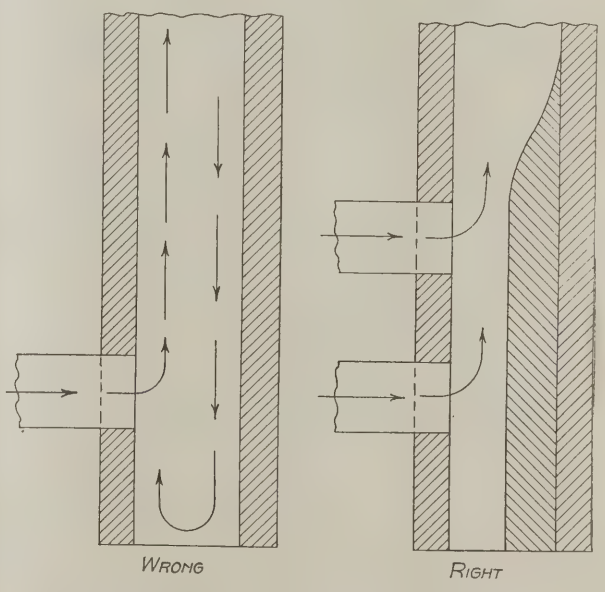
A NEWARK contractor having trouble with a steam plant invited an examination of the conditions by twelve individuals who seemed to have the necessary experience to enlighten him as to the cause of the trouble. No two agreed, and each was confident that he had solved the problem.

Among the opinions expressed were that the coal was poor, that the smoke flue was too long, that the chimney flue was not large enough, that it was too large, that it was due to the smoke flue not running up grade, that it was due to two fires being run on one flue, etc. The manufacturers of the steam boiler used sent a representative who declared on his twenty years' experience that the trouble was due to the chimney not being high enough, although it was one foot higher than the peak of the roof.

The builder himself discovered that the trouble was caused by an eddy of cold air at the base of the chimney flue.

These various wrong opinions were expressed by plumbers, steam fitters, masons, boiler salesmen and others who should have been able to explain such troubles promptly. Few people seem to have any definite idea of what the actual troubles in a chimney may be. There are at least fourteen definite kinds of such troubles that all builders should be familiar with and able to detect on sight.





Illustrating Some of the Causes of Chimney Trouble and Their Remedy

1—The flue may be too small for the work put upon it.

2—The flue may be too large and therefore the heat not sufficient to cause proper draft. These two troubles can be easily detected by consulting a table of flue sizes in most furnace catalogues.

3—Leaks where outside chimneys join the foundation walls. This condition can easily be traced by watching a lighted candle held near the junction point. An inward current will indicate such a leak.

4—Leaks between flue linings and the brick walls of the chimney.

5—Flue joints not set flush. These conditions should be prevented by inspection of the work as it progresses, and in the case of a straight chimney—and they should be vertical throughout—they can be detected by holding a pocket mirror in the base of the chimney at an angle that will reveal the sky above the chimney top, the entire interior of the chimney being easily visible.

6—The top opening of chimney may be too small. It is too small if smaller than the balance

of the chimney. It is best to finish with a flue lining larger than those below.

7—The top of the chimney may be too low. It must be 1 ft. higher than the roof, at least, unless 20 ft. away.

8—The flue lining should be a little higher than the brick wall and if lower it can cause trouble.

9—Aviators complain of "air pockets." These will spoil the draft of chimneys located next to higher buildings.

10—High trees adjoining will cause similar difficulty.

11—Sharp bends in a chimney can cause trouble by causing eddies and by reducing the capacity of the chimney.

12—A depression, or well, beneath the stove pipe hole, can cause an eddie that will be almost fatal to a chimney draft.

13—When a rather small flue pipe enters the base of a chimney a little larger than the capacity required, a cold air eddy may exist due to the cold air settling down one side of the flue while the hot gases pass up the other side. This can be cured by reducing the size of the flue as it approaches the base.

14—If the smoke flue does not fit air-tight all the way in to the inner flue lining there will always be trouble. There is especially a chance of leakage between the lining and the brick in this case.

Aside from the chimney there can be various troubles with the smoke flues, the one most often met being a square top smoke pipe for a kitchen range fitted with a small side connection with the chimney. The removal of such a misshapen appendage and the introduction of a round elbow pipe has removed the distress of a poor draft from many a kitchen.

Building Operations in Louisville

Some excellent plumbing and heating contracts in connection with new hotels are in sight in the Louisville district at this time, and prospects are for some good business breaking this fall or in the winter. At Cannellton, Ind., George W. Poll plans to rebuild the burned Cannellton Hotel, the new structure to have about fifty rooms in all. At Frankfort, Ky., plans are being formulated, according to C. F. Dunn, secretary of the Chamber of Commerce, for a new hotel with about 250 rooms. The old Capitol Hotel was burned a few months ago and has not been rebuilt, and the city hasn't accommodations and must build a hotel in time for the next session of the state legislature in 1918.

The largest deal is at Dawson Spring, Ky., where the Karlsbad Hotel Company of America, chartered under the laws of Delaware, with a capital of $6,000,000, plans to erect a hotel costing $3,000,000 and containing 1,049 rooms. The company has 800 acres of land and plans to put in a golf course, hunting preserve on 500 additional acres and erect an all-year health resort. The new company has taken over the Dawson Spring Hotel Company, the Dawson Hotel Company, the Arcadia Hotel and other organizations and plans to put a temporary structure in the spring, containing 200 rooms, to be used while the new hotel is being completed, it being estimated that it will require two years to build the big plant. The officers of the new company are: T. R. Troendle, president; D. B. McBee, vice-president; L. M. Boomer, managing director, and Will P. Scott, secretary. The president also acts as treasurer. Dawson for years has been the leading health resort of Kentucky and the new company has a big field.

Another big project consists of a $400,000 Farmers', Merchants' and Manufacturers' building at the State Fair Grounds, Louisville.

The Stanley Works' Employees Are "Doing Their Bit"

More than one hundred employees of The Stanley Works have left their positions to fight for Uncle Sam. They have gone with the National Guard, Officers' Reserve Camps, the New National Army, Navy, Ambulance Corps, and some, who for physical reasons were not accepted in other divisions, have entered the Government Munition Inspection Service.

Those employees who still remain at their regular work are doing everything that they can to back up their boys. Under the auspices of The Stanley Club a weekly letter on office and factory happenings is being sent to each former employee now in the Government Service. Recently an entertainment was given for a fund to buy tobacco for Stanley Works soldiers.

An average of one hundred girls employed in the office do Red Cross Work one evening a week. They do this work in the office and the company supplies them with supper.

A fund has just been raised among employees of The Stanley Works to purchase a complete ambulance equipment and present it to the Government, and one of the men now working in the Cold Rolled Steel Mill has volunteered to drive it.

For both the first and second Liberty Loans the company sold bonds to its employees for weekly payments extending over a year. On this basis over $100,000 worth of bonds was subscribed to for each loan, or an average of about $40 worth of bonds for each Stanley Works employee.

Owing to high prices and shortage of building materials, work is said to have been stopped on the construction of over forty stores and dwellings in Santiago, de los Caballeros, which is the trade center of the northern half of the Republic of Santo Domingo.

A Country House of the Colonial Type

Every Room Receives Light and Air from Three Sides—Some Details of Construction

THE frame house of well-considered design which we have taken for the subject of our four-color supplemental plate embodies features which are likely to receive more than passing attention from builders interested in country houses of moderate size. The design is economical as to construction and permits of a variety of treatment. The color scheme presented by means of our plate is not at all arbitrary, but may serve as a suggestion to those interested.

The building is two stories in height, and the main roof, which slopes from ridge to eaves, is broken by a series of dormers which provide light and head room on the second floor. There are two outside chimneys gracing end gables and giving added character to those portions of the exterior.

At the extreme right end of the house is an open porch easily accessible from the living room by means of French doors. The roof of the porch is flat and surmounted by a spindled railing which renders the space available as a sleeping balcony in summer if such use of it is desired.

The main entrance doorway is simple in its treatment yet thoroughly in keeping with the general design. A detail of it is presented in one of the accompanying pictures. The main roof extends slightly over the doorway, thus forming a hood and affording shelter from the elements. The overhanging roof is supported on each side by two brackets, between each of which is suspended a small bracket lamp. The door itself is given the appearance of six boards vertically arranged and in the upper part of which is an eight-light window.

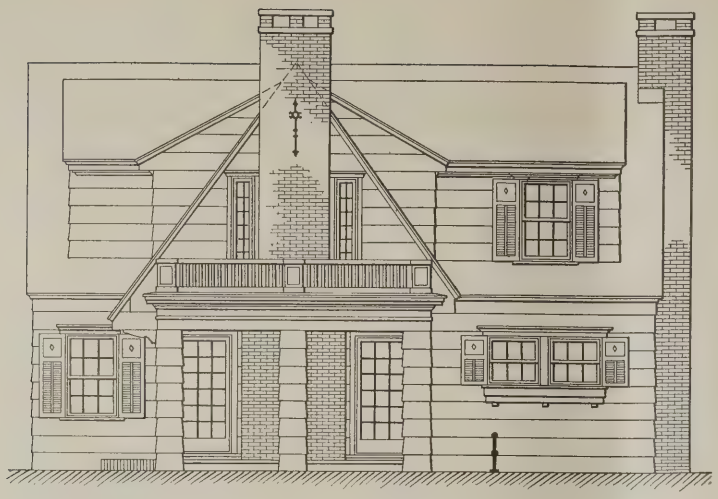


A View of the House Forming the Basis of the Colored Supplemental Plate and Showing Both Chimneys.—Architects Patterson & Dula, New York City

At each window of the house is an outside window box, as shown by the various pictures of the exterior which we present.

The entrance to the house leads directly into the living room. At the right is a brick fireplace framed with wood, as shown in the illustration on another page. On each side of the fireplace are French doors leading to the open porch.

At the left of the living room are the stairs leading to the second story, and also the glass door leading to the dining room. To the right of the



The Chimney End of the Living Room—Scale 3/32 In. to the Foot

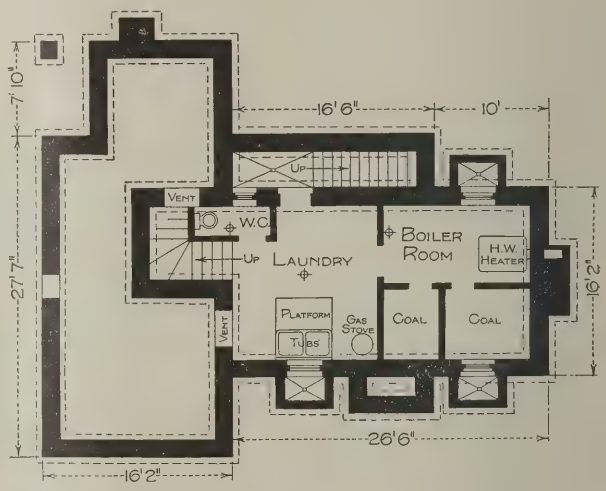
For the footings large stones were used, these extending 6 in. on each side of the wall. The foundation walls, piers, retaining walls, etc., were composed of large broken stones laid in mortar of a 1:3 mix, the foundation walls being pointed with Portland cement. Each pier was capped with a large flat stone. The stone faces in the areas were smoothly cemented.

The cellar floor consists of 3 in. of concrete mixed in the proportions of one part Portland cement, two parts sand and four parts gravel. A top dressing laid over this consisted of one part Portland cement to two parts sand.

The chimneys are composed of brick, with smooth struck joints for painting. At least 8 in. of brick are between

stairs is a door leading through a short passageway to the kitchen. The dining room, an interior view of which we present, communicates with the kitchen by means of a fair-sized pantry, which contains a sink and two dressers.

The kitchen is entered from the outside from a small porch; a near-by closet contains the refrigerator. At the right of the kitchen is the sink, which is placed under two windows so as to receive plenty of light. The range, too, is so placed as to receive plenty of light—a feature that the housewife cannot fail to thoroughly appreciate. The second story contains three bed rooms and a bath. The two bed rooms at the left are intended for the owner and the children and are connected by a passageway which contains a cabinet. A linen closet is placed where the hallway leads into the bathroom. A noteworthy feature of the second-story plan is the arrangement of drawers where the roof lines cut across the plan.



Foundation Plan—Scale 1/16 In. to the Foot



Rear Elevation of the House, Showing the Area Stairs to the Basement—Scale 3/32 In. to the Foot

Two Elevations and Basement Plan of the Country House of Colonial Type



BUILDING AGE
NEW YORK

the flue linings and the outside. The chimneys were flashed by means of what is known as "stepped" flashings, galvanized charcoal iron being used. The flues consisted of hard-burned fire clay lining run 8 in. above the chimney cap. The



The Street Approach to the House and Showing the Left Side Elevation

chimney was capped with a concrete slab cemented on the face.

The frame was put together with mortise and tenon joints, the timbers being straight grained square edge spruce and hard pine. All vertical timbers were in one piece.

Some of the sizes of the principal members, which were of spruce, are as follows: Sills 4 x 6 in., posts 4 x 6 in., plates 4 x 4 in., the first and second floor joists 2 x 10 in. placed 16 in. on centers, attic joists 2 x 8 in. placed 16 in. on centers, studs 2 x 4 in., excepting where soil pipes were to be run and there 2 x 6 in. studs were used, main rafters 2 x 8 in., dormer rafters 2 x 6 in., and braces 2 x 4 in. The floor joists were braced with 2 x 3 in. stuff placed not more than 8 ft. on centers and double nailed at each end, the lower end being nailed after the rough flooring was put down.

The posts were mortised to the plates and sills, the studs being spiked to the plates and sills and doubled where necessary. Partition caps and sills consisted of 2 x 4 in. spruce, doubled. All openings were braced and trussed.

All trimmers were placed 12 in. from the inside face of the boiler flues and 8 in. from all other flues, and 4 in. from the inside of the chimney breasts. Headers were placed not less than 4 in. from the outside of the chimney breast. All joists were crowned and blocked level. Headers and trimmers were doubled, the tail beams being framed into the headers. In cases where headers were over 4 in. wide they were hung in iron stirrups.

The plates break joints over the studs. Sills and plates are halved at corners, the sills being thoroughly bedded in cement.

The roof is covered with red cedar shingles exposed 4½ in. to the weather and laid over shingle lath of 1¼ x 2 in. spruce. The cornices of the main roof and dormers have a molding under the edge of the shingle line, with plain fascia.

The sheathing, which consisted of ⅞ x 6 in. tongued and grooved North Carolina pine, was nailed diagonally with the joints breaking on the studs. Over this was nailed Neponset building paper, which was covered with shingles exposed 12 in. to the weather.

The interior trim consists of cypress which was given three coats of linseed oil and white lead. The blinds were painted green. The porch decks were covered with heavy canvas painted on the under side before laying and given two coats of paint at completion.

The end soffit of all eaves consists of ⅞ x 2¼ in. tongued and grooved North Carolina pine which was shellaced and given two coats of spar varnish.

The front porch consists of tapestry brick laid on end and forming a border for the center part of which is composed of cement.

The front entrance door is 2½ in. thick. Interior doors are of the one-panel type 1¾ in. thick. In the service portion of the house the doors are of the five-panel type 1½ in. thick. The doors throughout the house are of the Morgan variety.

The windows are of both casement and double-hung type, the glazing being double-thick American glass. The double-hung frames are of white pine, the sills and stiles being of yellow pine. The casement sash are 1¾ in. thick and open out.

The interior trim is of white wood, excepting in



Detail of the Main Entrance Doorway

the living room, where it is of oak, and in the service portion, where cypress is used.

Three coats of plaster were applied over spruce lath and troweled to a hard white finish. Plaster grounds were ⅞ x 1½ in. stuff.

The floors throughout are double; the under floor-

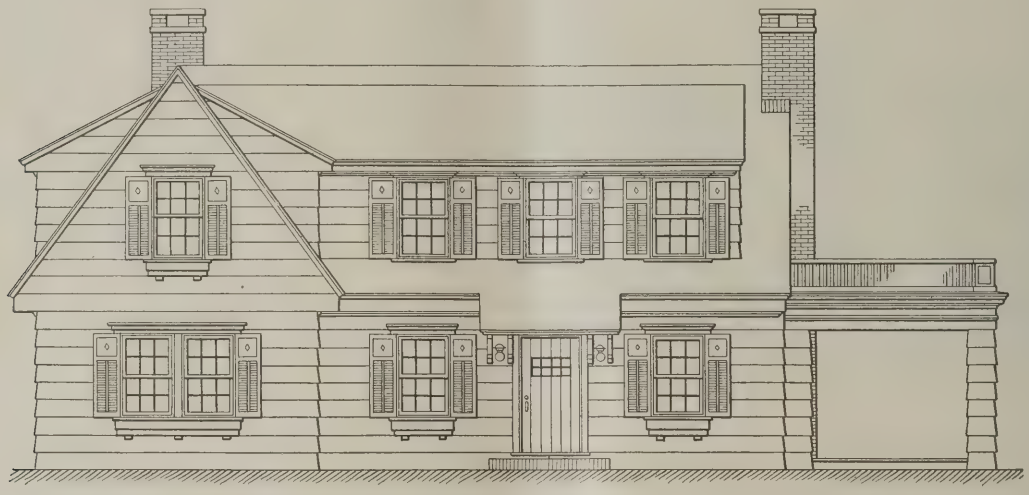
ing being of 7/8 x 6 in. tongued and grooved North Carolina pine, over which was laid building paper. On top of this, in the living room, dining room and the main portion of the second floor, was laid 7/8 x 2¼ in. comb grained Georgia pine. Other floors are of 7/8 x 2¼ in. edge grained North Carolina pine. At completion the floors were given one coat of liquid filler and two coats of floor varnish.

The main stairs are of oak, the risers being 7/8 in. and the tread 1⅛ in. thick. The skirting and wall string are two-member 7/8 in. thick and molded with a soffit molding 7/8 x 3 in. Square balusters with paneled and molded newels were used, together with a 3 x 4 in. hand rail, molded, ramped and eased. The cellar stairs were constructed of North Carolina pine.

The trim and stairs were given one coat of filler, one coat of shellac and two coats of varnish, well rubbed between coats. The last coat was rubbed with pumice stone and oil to secure a dull finish.

The fireplace in the living room is of tapestry brick. A Boston throat damper was provided. The hearth is of brick, and is carried upon a trimmer arch, the space between the trimmer arch and the hearth being filled with concrete.

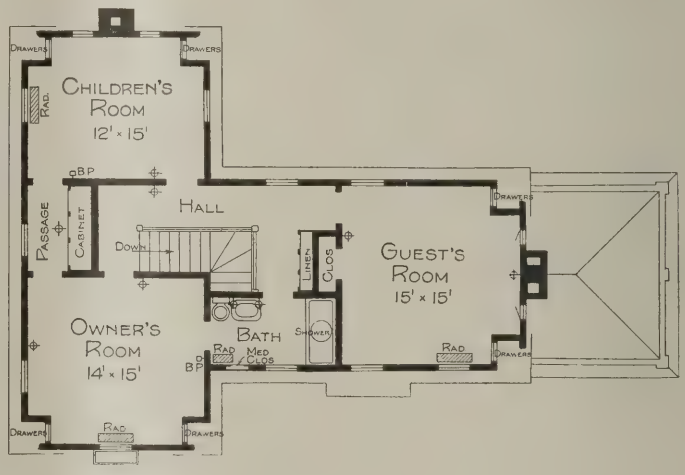
The floor of the bathroom is of 1 in. hexagonal vitrified white tile. For the walls, metal lath was used to a height of 4 ft. 6 in. and a heavy coat of Portland cement mortar of a 1:2 mix was applied and this in turn received 3 x 5 in. glazed tile, which connected to the floor by a 6-in. sanitary base with a molded cap. A medicine cabinet with plate-mirror doors is a feature. The bathroom fixtures include a "Standard" porcelain enam-

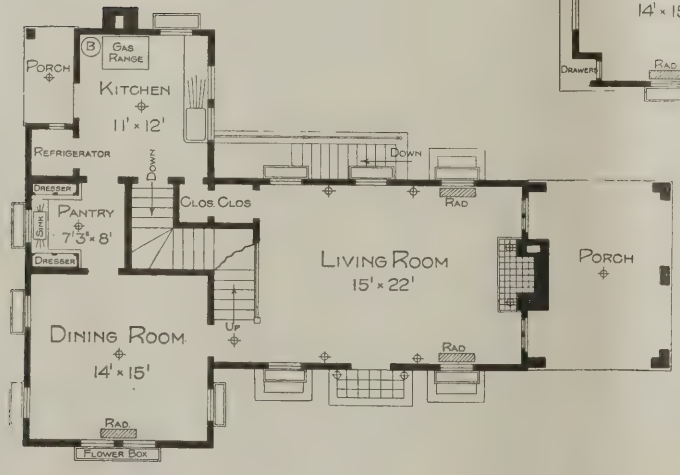


Front Elevation of the House—Scale 3/32 In. to the Foot

At the Right Is the Second Floor Plan, Showing Bath Room at the Front and Accessible from Owner's Room and from the Hall

Scale 1/16 In. to the Foot





Main Floor Plan—Scale 1/16 In. to the Foot

Elevation and Floor Plans of House Shown on Colored Supplemental Plate

eled "Recona" bath, a "Standard" porcelain enameled "Laton" lavatory and pedestal, a "Standard" vitreous china "Ejecto" closet combination complete with vitreous china low down tank with china handle lever, "Ivorite" seat and cover.

The kitchen hearth is of concrete carried over a trimmer arch. The wall back of the range is wainscoted to a height of 4 ft. 6 in., using metal lath which received a heavy coat of Portland cement mortar of 1:2 mix. Some of the kitchen fixtures include a "Standard" porcelain-enameled roll-rim sink with integral back and wall hangers. The range is a Janes & Kirtland "Beebe" No. 12.



The Living Room, Looking Toward the Main Stairway and Showing the Entrance Door at the Left

Electricity is used for lighting, the installation being what is known as the knob-and-tube system.

The house is heated by means of a one-pipe steam system with gravity return, the pipes being covered with asbestos cement.

Hanging gutters with Berger galvanized iron hangers and galvanized iron straps were used, the edges being turned over the moldings and tacked down smoothly.

This house is located at Scarsdale, New York, and was built for the owner, Philip H. Kuss, in accordance with plans and specifications prepared by Architects Patterson & Dula, 523 Fifth Avenue, New York City.

The contract for the work was executed by Adam Kirschoff, New Rochelle, New York.



The Open Fireplace in the Living Room, Showing the French Doors to the Porch at the End of the House

Join the Civic Ranks as a Technical Guildsman

In connection with or in response to the call of the President for volunteers, the attention of all technical men—*i.e.*, men skilled in any line of science or mechanical or electrical or chemical or ordnance or explosives or mining or shipbuilding or railroad or motors or metallurgy or building of aeroplanes or water supply or sanitation, etc., is especially invited to the need of the Army for such men—aged 18 to 40, in sundry branches of technical troops, concerning which write for literature to Maj. J. E. Bloom, U. S. A., 266 Market Street, Newark, N. J.

Any technical "men who are exempt," or who from any cause cannot "volunteer," can yet efficiently co-operate by forming technical patriotic educational guilds in their several industries or home neighborhoods, especially to look after the welfare of their men in the service, and to give them the opportunity of obtaining technical assistance, opinions and advice from home, in any war industry.

Veneering is not a modern invention, as it is said to have been introduced in the time of Pliny, about 50 A. D., to reduce the cost of the enormously expensive tables of rare woods that were much sought after by wealthy Romans.

Brief Review of the Building Situation

Figures Showing Building Activities in Various Sections in October, 1917, and October, 1916

AS the demands of the Government must necessarily take precedence over all other needs, these have been and still are the predominating factor in building construction. The embargo on materials, wholesale commandeering of certain sizes of yellow pine and the entire speeding up for the building first of cantonments and now of ships have all contributed to make materials and skilled mechanics scarce and have considerably influenced the high cost of building. As there seems little likelihood that prices will fall, many architects are urging their clients to go ahead and build now, on the ground that prices may go even higher before a halt is called.

These factors all have had their bearing on building construction throughout the country, there having been but little activity during October except in the building of factories catering to wartime needs. Thus the loss of 36 per cent for the whole country for October, 1917, compared with October, 1916, is not surprising. Out of 113 cities reporting, 24 show a gain.

A comparatively large amount of construction is being done in the East, the loss being only 29.42 per cent, which is small compared with that shown in other sections of the country.

CITIES IN EASTERN STATES

	October, 1917	October, 1916
Allentown	$77,725	$118,535
Altoona	7,651	96,869
Atlantic City	124,113	127,120
Bayonne	69,300	87,645
Binghamton	243,867	130,928
Boston	12,319,000	7,591,000
Bridgeport	208,315	572,463
Brockton	55,323	80,825
Buffalo	1,014,000	972,000
East Orange	78,215	177,544
Elizabeth	71,055	159,226
Erie	156,959	348,242
Harrisburg	146,160	140,526
Hartford	242,065	1,171,569
Haverhill	40,187	136,650
Holyoke	35,375	109,190
Lawrence	32,825	107,315
Manchester	127,769	194,989
Newark	1,084,708	663,790
New Bedford	80,475	407,312
New Britain	65,378	276,825
New Haven	140,500	641,605
New York:		
Manhattan	1,582,798	6,776,606
Bronx	387,786	1,192,032
Brooklyn	1,699,280	3,186,199
Queens	1,046,049	1,755,790
Richmond	220,731	456,145
Niagara Falls	119,059	116,373
Passaic	21,000	219,545
Paterson	81,626	200,859
Philadelphia	2,030,475	4,055,045
Portland	266,420	695,945
Quincy	102,531	124,773
Reading	24,125	145,275
Rochester	5,740,235	8,179,826
Schenectady	104,643	222,670
Scranton	236,975	90,295
Syracuse	221,834	463,865
Troy	15,339	62,875
Utica	108,675	238,275
Wilkes-Barre	41,851	84,478
Worcester	189,669	554,608

Cities in the middle section of the country show a loss of 45.88 per cent, which is more than that of any other section.

CITIES IN MIDDLE STATES

	October, 1917	October, 1916
Akron	$673,255	$1,077,088
Canton	129,575	322,685
Cedar Rapids	241,000	267,000
Chicago	2,756,700	11,408,300

CITIES IN MIDDLE STATES—*Continued*

	October, 1917	October, 1916
Cincinnati	572,695	823,880
Columbus	287,835	575,630
Davenport	81,335	121,590
Dayton	110,310	223,395
Des Moines	204,199	345,130
Detroit	4,311,385	5,755,540
Dubuque	46,590	47,275
Duluth	245,209	227,916
East St. Louis	234,550	112,500
Evansville	24,715	90,287
Fort Wayne	106,355	302,500
Grand Rapids	109,670	174,270
Indianapolis	479,526	784,772
Kansas City, Kan.	85,863	52,890
Kansas City, Mo.	547,050	1,118,460
Lincoln	429,930	69,575
Milwaukee	1,068,669	1,658,272
Minneapolis	917,435	1,454,675
Omaha	610,890	436,640
Peoria	233,325	193,465
Saginaw	26,495	63,965
St. Louis	557,070	1,333,381
St. Paul	431,050	880,512
South Bend	94,176	116,535
Springfield, Ill	95,095	81,265
Superior	35,294	377,226
Terre Haute	37,500	173,999
Toledo	465,264	774,544
Topeka	10,900	37,576
Wichita, Kan.	662,345	86,975
Youngstown	364,300	382,480

The South makes a fairly good showing, there being a loss of 19.06 per cent.

CITIES IN SOUTHERN STATES

	October, 1917	October, 1916
Atlanta	$238,606	$311,107
Baltimore	729,281	680,000
Birmingham	148,583	148,733
Chattanooga	108,727	55,403
Dallas	68,120	181,226
Ft. Worth	108,730	224,647
Jacksonville	102,470	111,985
Louisville	83,720	321,500
Memphis	163,585	320,560
Montgomery	28,813	30,845
New Orleans	98,327	121,402
Norfolk, Va.	172,025	144,999
Oklahoma City	332,612	305,423
Richmond	99,594	397,745
San Antonio	239,035	76,086
Savannah	3,495	29,215
Shreveport	121,323	194,284
Washington	809,760	1,099,744
Wilmington	356,190	204,070

Western cities show a loss of 43.52 per cent, the most notable instances of decreased operations being Los Angeles, Seattle, Stockton and San Francisco. The notable increases are found in Pasadena, Pueblo and Sacramento.

CITIES IN EXTREME WESTERN STATES

	October, 1917	October, 1916
Berkeley, Cal.	$91,000	$179,250
Colorado Springs	35,425	15,544
Denver	243,350	277,350
Los Angeles	988,142	1,408,738
Oakland	367,585	441,690
Pasadena	102,519	75,151
Portland	48,570	518,647
Pueblo	252,440	134,390
Sacramento	347,469	120,162
Salt Lake City	119,380	260,435
San Diego	41,425	148,814
San Francisco	852,319	1,010,464
San Jose	29,509	373,120
Seattle	509,405	1,894,305
Spokane	66,195	122,702
Stockton	50,401	429,541
Tacoma	88,815	96,427

A press dispatch bearing a Chicago date line reads as follows: Board No. 80, in Austin, examining drafted men, reported to-day that it had exempted A. Ford Carr on account of faulty headlights, both his eyes being below normal.

BUILDING AGE

THE DEALER'S DEPARTMENT

New Idealism of American Industry

Precludes "Annoying Practices" in the Lumber Trade, and in All Branches of Other Trades

By C. E. Davidson

PROF. WILSON COMPTON, Economist of the Federal Trade Commission, Washington, D. C., recently read a paper at Chicago before the Wholesale Sash & Door Association in which he outlined "new thoughts in business," and all of which he terms "New Idealism of American Industry." Much of what he said applies to the lumber industry, and I am pleased to note, much of it fits in splendidly with my ideas for a better and closer understanding of retailer and wholesaler.

He speaks of the "pitiless, relentless, almost limitless competition" and abuses of days past, and predicts the full fruition of American industry is to come when we in the lumber business, and others in their lines, shall make it possible that regulation through *understanding*, and not by compulsion, shall come. He emphasizes the word "understanding." He says it is a moral achievement, that "the test of the day is the test of efficiency," and should that be applied retailers would no longer have to complain of bad loading, off grades, etc. He says "efficiency is enthroned." And again, "there is a business conscience, as well as a business sense," to all of which I say amen, and again, amen.

Again he says that "the 'Ethics of the Trade,' the 'Square Deal,' and 'Good Faith,' are phrases that find a more prominent place than formerly in the vocabulary of American industrial life. They are only symbolic of a new attitude, a new awakening, a new conscience. They are the symptoms of a changed thought and of a new direction given to American enterprise. They are the expressions of a true industrial democracy. Democracy is the call of the hour. Democracy pleads for equal rights, equal privilege, equal opportunity. To this plea is the answer of Square Deal, Good Faith and the Golden Rule."

Thanks, Mr. Compton. Now I don't feel quite so lonesome. But hear him further:

"Consider for a moment the ways in which the new ideals of business have reshaped business practices. For example, the course of many of the abuses in business and of much of the extraordinary power wielded by large corporations or interests was conceived to be the use of *unfair methods* in business. If unfair trade practices could be eradicated equal opportunity would obtain and would preserve reasonable prosperity to those engaged in business and give security to the public."

Right here I pause to ask, if it is fair to adopt a "terms of sale," which in effect compels a man to pay for a car of lumber costing from $600 to $1,500 before the buyer has had an opportunity to inspect it?

Mr. Compton again says: "It is often said that anything is fair in business. There is only one thing certain that may be said of such a statement and that is, *It is not true.* Nothing is fair in business nowadays which deprives others of an opportunity to thrive and grow and prosper equal to the opportunity which you possess yourself."

He divides the "new thought in business" into four divisions:

First. Business to be efficient.

After reading the accompanying excerpts from the address of Prof. Compton there would seem to be no reason why retail lumber dealers should not ask for the virtues of decency, the square deal and the practice of the Golden Rule, while at the same time proclaim a conscience in business.

It is to be noted that old prejudices are gradually being wiped out and a modern progress made the keynote of the times, all of which is shown in the citations to be found in Mr. Davidson's article and in the reference to abuses to be remedied and corrected.

Retailers must do away with timidity and reserve when voicing complaints against unjust practices and must act with a firm belief in the righteousness of their cause if they expect to attain success in their business. In many cases retailers are too modest or too indifferent to adopt such a course and the result is imposition.

In the sale of lumber there is unquestionably a great lack of co-operation between the salesman and the mill for whose account he accepts orders. Correct this and you eliminate many of the causes for complaints of unfair treatment in the trade.

Second. Business to be fair. No unnatural or arbitrary advantage possessed by any one.

Third. Business to be systematic, intelligent and well informed.

Fourth. Business is to give the square deal. This means simply that business must be *decent*, responsive to the ethical demands of an awakened conscience and of an enlightened public opinion.

"Decency" and the "Square Deal" in Business

He goes further and elaborates on what he calls decency, square deal, etc., in business, and it is indeed refreshing to read his address. It is a splendid one, though perhaps he may receive some criticism for uttering it. His motives may be misunderstood, but his address is educational and will bear fruit, let us hope.

There is no reason why retailers should not ask for the virtues of decency, square deal, and the Golden Rule, and proclaim a conscience in business.

A state secretary of a very prominent State Retailers' Association has just written me a congratulatory letter concerning the articles appearing in BUILDING AGE dealing with "Annoying Practices in the Retail Trade," and concludes his remarks with these words: "You are doing a good work; we lumbermen need you as a beneficent iconoclast to keep us orthodox," etc.

What an "Iconoclast" Really Is

Literally, an iconoclast is a destroyer of idols, but, as applied in modern times, has been made to describe one who ventures forth from routine or dares to investigate the new things; to have an open mind, and, if reason justifies, to discard the old for the new and better. When a boy I lived in a small country village and I vividly recall to this day a citizen buying the first new top buggy. He was at once charged with extreme and unjustified extravagance, vanity and a wicked and abandoned heart; top buggies were instruments of his satanic majesty, and his wife immediately took a vow never to ride in it, and she never did. It had nearly every color of the rainbow—violet, blue, green, orange, yellow and red. It was a sight for the gods. But I lived to see the day when nearly every one owned a top buggy.

The Light in which Improvements were Regarded by the Local Community

Again I removed to a larger city. Waterworks were proposed. When the city council met to make the contract, there was a riot. It was said we had gotten along with cisterns and wells and they were good enough; besides, we could never pay the bonds. A little later, soon after the Chicago World's Fair, along came a man and suggested we put in electric lights. Well, of course, that was the limit with the "mossbacks," who said that Mr. H., the banker, was the only man in town who could really afford them. The lights came, and gradually we all installed them.

Then came the telephone. I was one of the first 18 persons who installed a 'phone in Greenville, and to-day our Exchange numbers its 'phones by the thousands. The same with paved streets. To tax adjoining property for paved streets was "taking property without just compensation," etc. Yes, sir. It was autocratic. Yet to-day our streets are paved and not a single citizen would have removed our waterworks, our electric light, our telephones or our paved streets. The same with the automobiles.

Old Prejudices Were Torn Down

The iconoclasts tore down the old prejudices and went ahead with modern progress. And, why not with the retail lumber dealers? Why not ask to have abuses remedied and corrected. It is true we may be criticized, or it may be unpleasant to oppose old and established methods, even if they are crude, unscientific and wrong. We have no malice against any wholesaler or mill man, in fact, we feel a kindred interest in their affairs, but we must insist that orders be shipped correctly and contracts be fairly kept.

Many retailers are too timid to voice their complaints, though there is not a single one from the Atlantic to the Pacific who has not just cause to complain. I have picked from my correspondence for this issue one which is so typical of so many instances that it is entitled to special mention. I feel assured that every retailer who reads it can say that the same thing has happened to him time and again.

Filled the Order Wrong

P. J. O'Brien, lumber dealer at Rochester, Mich., writes me saying:

"Noting your article in the BUILDING AGE for October, I would say the worst deal that I have is as follows: On May 24, 1917, H. W. Reeves of Detroit, Mich., took my order for one car of yellow pine, shiplap, he stating it would come from W—— G—— Lumber Co., Jackson, Miss.

Of what the Order Consisted

The order as given by Mr. Reeves reads as follows:

6 M ft. 1 x 10, 12 ship lap.
6 M ft. 1 x 10, 14 ship lap.
6 M ft. 1 x 10, 16 ship lap.

making 18,000 ft. On July 11th they shipped

61 pieces	6 ft. long	305 ft.
81 pieces	8 ft. long	513 ft.
81 pieces	10 ft. long	675 ft.
256 pieces	12 ft. long	2,560 ft.
420 pieces	14 ft. long	4,900 ft.
1311 pieces	16 ft. long	17,480 ft.
49 pieces	18 ft. long	735 ft.
15 pieces	20 ft. long	250 ft.
Total		27,445 ft.

On receipt of invoice, Mr. Reeves wrote them that this was not what the order called for, and they replied that the order from Mr. Reeves did not state any lengths, and, if it had, they would not have accepted the order. The car came on and the quality was poor. He told them that he would take the car with a reduction of $1 per M, which was a good price for the stock. They wanted to send a man from down South to Michigan to inspect the car at a great expense and this Mr. Reeves said he "would not stand for." Why? No doubt because Mr. Reeves knows that the present plan of sending

a grader from an association, organized and run for the mills and using a set of grading rules made by the mills for just such instances, was a farce. That every piece which "was down on the line" would be counted in as grading and that he later would receive a report to that effect.

Lumber Grading Rules

In the last issue of the BUILDING AGE I discussed the grading rules, how they were established for just such emergencies, how the mills did not ordinarily ship lumber which would barely grade, and did not expect to do so, but that occasionally when a retailer with enough backbone to demand his rights complained, they could say to him, "the lumber grades and our lumber is all sold under the specifications of the established grading rules," and thus fortify themselves in a legal way.

The mill also told Mr. Reeves to keep every piece in tact. Here they had Mr. Reeves again. He had already put some of the lumber out on jobs he had contracted to furnish, and this stock he no doubt expected to pay for in full. When it came settlement time, Mr. Reeves asked for $1 per thousand reduction and remitted accordingly. He was at once given the alternative to "pay up" or a suit would be instituted, and he paid the bill in full. Just what hundreds of others have done and are doing.

Company Should Make Good Orders of Agents

Here is a case where a wholesaler is accepting orders from a salesman and therefore making him their agent, but when it suits their convenience repudiating his agency. From a legal standpoint I think the company should have made good the contract of their agent who took the order, but to make himself secure from a legal standpoint Mr. Reeves should have refused to unload the car under the plea that the mill had not complied with its part of the contract, that is, should never have accepted it, which his unloading impliedly admitted. But he needed, no doubt, some of the lumber very much and was compelled to do so, and suffer the loss occasioned by the off grades and wrong loading.

It will be noted that the mill unloaded off onto him 17,480 ft. of one length, which was almost eleven and one-half thousand more feet than he ordered. There can be no justification for such proceedings. Does this happen in the grocery or clothing line? How long would such practices be tolerated in other lines? Suppose a harness man should order six sets of double work harness and the wholesaler should send him seventeen, then complained of the shipment, with the result he would be told he had to pay up or get sued? Apply the example to any other line, and the practice appears more unconscionable.

Woeful Lack of Co-operation Between Salesman and Lumber Mill

At any rate, here is an instance which only proves my previous statements that there is a woeful lack of co-operation between salesman and mill.

I dare say there is no other business of equal proportions in volume where such lack business methods, or domination, are employed, as in the lumber business. There seems to be a lack of sympathy between the wholesaler and the retailer—the man who distributes the lumber. They are like cats and dogs in temperament. There is no Golden Rule. This ought not to be. The mill in this instance in all likelihood lost a customer. No doubt it doesn't care; it will live just the same, but how much better if the whole matter could have been amicably and conscientiously adjusted.

Course of Instruction in Lumber Business

A Two Years' Course by the Harvard Graduate School of Business Administration

THE Harvard Graduate School of Business Administration, in cooperation with the Department of Forestry, has recently announced a course of instruction in the lumber business for college graduates who look forward to undertaking some branch of lumbering for a life work, and also to graduates of forestry or engineering schools who desire special instruction in the lumber business.

The course covers two years, and upon completion graduates are given a degree of Master in Business Administration. The instruction offered covers field and class work in logging and saw milling, general lumbering, the principles of forestry, the marketing of lumber, accounting principles, commercial contracts, factory and financial management, business policy and related topics.

"Lumbermen realize as never before the tremendous responsibility that devolves on them in connection with a restoration of the world's merchant marine," says J. E. Rhodes, secretary-manager of the Southern Pine Association. "Without an appreciable increase in the production of new ships we cannot hope to win the war. For, in spite of the fact that the submarine campaign has been brought more nearly under control than some months ago, the submarines are now sinking tonnage at the rate of 150,000 tons a week, while America's production of new ships has been only 50,000 tons a week. This disparity must be overcome."

Impressions of a "Building Age" Traveler

Comments on Self-Advertising Which Is Not to Be Recommended—How the Successful Dealer Operates

"I DON'T advertise," said a dealer I dropped in on one day recently, "because it doesn't pay. This is a dead town, any way you look at it, and if advertising *did* pay, it wouldn't work *here*. There's no opportunity to build up a business in this place."

Nothing original about that remark! I had heard it many times before, but never under circumstances that pointed so strongly its merit as the text for a little straight - from - the - shoulder preaching.

His advertising appropriation is the money he ought to be making and *isn't*. It is the profit his competitors *are* making out of his lack of perception and energy.

I don't recall that I have ever seen a retail lumber office scene featured in a burlesque show, but if any producer wants material for a stage setting that would make a hit, let me take him around this establishment.

All of the old tradition of the worst elements of retailing are to be found here. Filthy floor, unwashed windows, foul cuspidors last year's calendars hanging on grimy walls, furniture of the Civil War period, ready to fall apart, a bookkeeper and office man who looks like a character out of an Indian novel, and who is too tired to attend to the occasional customer's wants.

Go out in the yard and you find the same condition there—lumber badly piled, rubbish everywhere, no stock of any of the "new-fangled" things that progressive retailers are eager to sell—wallboard, roofing, cement and such lines. A pair of decrepit mules and a tumble-down wagon are ample delivery facilities because most people don't know that this is a lumber yard—they think it is a junk business. It has so advertised itself.

I have read a lot of discussion of the money wasted in advertising and publicity, but most of it has entirely overlooked this item. How many drug stores do you know where you would not think of trading because fly-specked windows and counters and untidy arrangement of stock announce to all the world someone's unfitness? How many restaurants can you recall where the soiled table linen and the reeking kitchen odors announce someone's incapacity to manage a business?

This sort of advertising *never* fails to produce a full measure of results. Advertise your own unfitness and you will find no one to dispute your claim. Yet this sort of advertising costs in proportion to the results produced just as the other kind does. It costs even more, proportionately. Its costs are cumulative: Public disfavor, mistrust, contempt, eventually bankruptcy, these are the items.

The story here told typifies in striking degree the difference in results accomplished by the inefficient man and by the one who is wide awake to his opportunities. The former unconsciously advertises his incapacity to conduct successfully any sort of a business while the other fellow establishes a reputation for worth and merit through his progressive methods of doing things.

In his case the result was a lot of business that might never have materialized had he not gone out to get it. He was therefore compelled to enlarge his facilities, increase his working force and carry larger stocks of materials.

One point brought out emphasizes the advantages of carefully reading your trade papers and absorbing the valuable information contained therein.

Years ago I knew a man who owned a farm out in northwestern Illinois, where the soil is black and about as rich as you can find in this big country. He had 160 acres of land with a little house, a couple of little barns and a very big mortgage. I also knew an implement dealer in a nearby town who was so eager for business that he tried to lend that farmer money to buy some modern implements of which he stood in great need (according to the implement maker's notion) to increase the productivity of the farm. I also knew the lumber dealer who tried to sell that farmer—on almost unlimited credit—material needed to put the house in habitable condition, to repair the barns and other outbuildings. It happened that those dealers were live ones, awake to every business opportunity, and they knew that this particular farm was a golden opportunity if only its owner could be induced to work it properly. But he thought differently.

He said the "improvements" on the place were plenty good enough for him. Anyway, he reckoned some day he would pull up stakes and move to Western Canada, where a man could get good land —all he wanted of it—for nothing. So he would not put any money into fixing up the place. And as for implements—well, he did not take much stock in those new-fangled ways of doing things. He believed in the good old way; just get up early in the morning and work till bed time and make life as miserable as possible for the hired man. So he ignored all efforts to thrust modern methods on him, and managed to come near enough to meeting the interest on the mortgage so that it was about five years between the time he bought the farm for

$25 an acre and the day the sheriff sold it to satisfy the mortgage. When that happened, he consoled himself with the thought that it wasn't much of a place, anyhow. Everybody in those parts said it



All the Worst Elements of Retailing Were to Be Found Here

was too bad that Charters couldn't make a go of the place, but it was his own fault, and when he tried to get Jim Cahill, the shrewd old banker, to stake him on another venture, he got a cold turn down; so he finally had to do what he had talked about so long—go West.

Willson, the man who bought that farm, was a different sort altogether. He had very little money, but plenty of nerve, and on that asset, chiefly, he managed to get enough credit to put the place in fine shape. He bought all the machinery he could use—and even some he couldn't—but the second year he took a crop off that land that startled the neighbors. In three years he had the reputation of being the most successful farmer in the whole community, was paying off his debts and had an enviable reputation at the bank.

That is about all there is to the story except to add that Willson eventually sold the place for $225 an acre and there wasn't a dollar of debt against it when he sold it—in fact, he had a very substantial balance in the bank.

Now, my point is this: It was only by accident that Charters and Willson happened to be farmers. They might have been merchants, and, if they had been, the result would have been just the same. Charters would always have felt that the real opportunities lay somewhere else; that it was not worth while to try to do much with the problems immediately before him. "What's the use," I can imagine him inquiring, "of trying to build up a business in this community? Everybody knows it's dead. What I ought to do is sell out and go some place where things are going on." And, feeling that way, he would not have taken the trouble to see that the office was swept out, that the windows were clean, that the stock was well assorted and in order, that he had some good business-getting advertisements in the local paper.

He would not have taken pains to find out how many people who ought to be his customers were buying goods from the mail-order houses at prices higher than his, just because they thought his prices were higher than they really were. He would not have taken the trouble to talk over his business problems with his fellow merchants, to get their ideas on how to go after more business. He would not have spent the time necessary to read some good publication that could help him put his business on a better basis—no, indeed! He was too all-fired lazy to take a publication out of the wrapper. He never read a farm journal in his life; he didn't even read the notice of the mortgage sale when a deputy sheriff nailed it on the front door of the house. He was sufficient unto himself, and it never occurred to him that his failure was in any degree his own fault.

Willson, on the other hand, was a different type. Drop him out of an aeroplane in the mildle of the Sahara and he would get busy and figure out a way to make a profit out of selling sand. But it isn't necessary to speculate on what he might have done; he went and did it. He moved into a nearby town and opened up a lumber yard. He is getting things in shape now to turn that business over to his son, and it is the most prosperous retail lumber business in five counties. I asked him one day recently how he did it. The question took him off his feet for a moment, because he never had taken



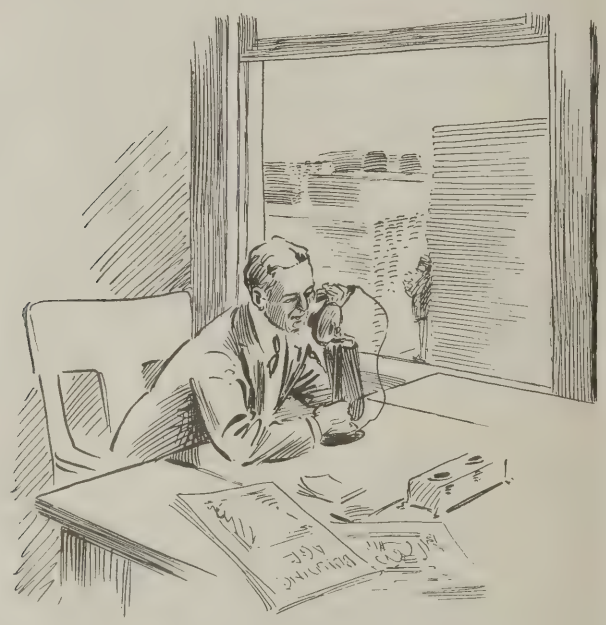
Willson Was a "Natural Born" Business Man

the time to analyze his own methods. You see, he was a "natural-born" business man. His progressive methods were spontaneous rather than the carefully planned-in-advance kind. But we talked

the subject over for two hours, and I found that the salient features were these:

When he opened his yard he picked the best location he could find near the heart of town, put a well-planned office on it and built some substantial storage sheds from designs he had worked out after two years' study of the subject. He had this venture in mind long before he sold the farm, and so spent a lot of spare time planning for it. He had the notion that a properly arranged establishment would operate more profitably than the types of yards with which he expected to compete. So he got right down to hardpan and made a study of retail yard layout, operation and management. And most of the help he got, he admits, came from reading a collection of trade publications.

When he started out he hired a yard man and a bookkeeper. He had a hard time getting them acquainted with his ideas about how the office and yard must be kept clean and neat, and inducing them to an appreciation of the fact that they must



With Willson Spending His Spare Time Reading His Trade Journals and Talking with Neighboring Dealers Who Had Ideas He Could Utilize, He Was a Pretty Busy Man

exert some effort to make sales. Several changes were made before he got the right team and had them working together as he thought they should, but this was finally accomplished.

His rating was good from the start, so he was visited by a host of salesmen, some of whom were intelligent enough to see an opportunity to establish themselves firmly with a new dealer by offering helpful hints and suggestions that he was able to use in ways that helped the growth of the business. He learned then that time spent with a *real* salesman is never wasted.

How He Went After Business

After he got his plant laid out and his initial stock in, he went out after business among his former neighbors and acquaintances. He knew their business—farming—a lot better than he knew the retail lumber business, so he was able to see where many of them could make improvements that would be bound to prove profitable to them and that at the same time give him a chance to sell material. He says he tried on these farmers all the best methods of selling that the lumber salesmen tried on him. (He did not have the benefit of contact with other salesmen for he started this business before lumber yards took on numerous side lines.

The Methods Proved Highly Gratifying in the Way of New Business

These methods proved productive of a lot of business that might never have materialized if he had not gone out after it, and his trade started to grow steadily after the first couple of months. In a year he had to add more help and put in his own delivery facilities—the latter because he found that prompt delivery was a thing to conjure with in meeting competition. Thus the business came along for several years, with Willson spending his spare time reading his trade journals and talking with some of the neighboring dealers who had ideas that he could use and were glad to swap those ideas for some of his.

Sales Fell Off While Building Was Active

The progress he was making looked almost too good to be true—for a time—but he had a jolt coming, and it came when he wasn't looking—as such things generally do. It came in the shape of a marked falling off in sales at a time when building was very active. It showed up in the monthly statements several times before Willson realized that something had gone seriously wrong.

(*To be continued*)

Definition of Knots in Wood

According to the American Society for Testing Materials, knots in timber are classified as round and spike in form, and as sound, encased, loose and unsound in quality.

A round knot is either oval or circular.

A spike knot is one sawn in lengthwise direction; the mean or average width being considered in measuring these knots.

A sound knot is solid across its face, and as hard as the wood surrounding it; it may be either red or black, and is so fixed by growth or position that it will retain its place in the piece of timber.

An encased knot is one whose growth rings are not inter-grown and homogeneous with the growth rings of the piece it is in. The encasement may be partial or complete; if inter-grown partially or fixed by growth or position that it will retain its place in the piece, it is considered a sound knot; if completely inter-grown on one face, it is a watertight knot.

A loose knot is one not firmly held in place by growth or position.

An unsound knot is one not as hard as the wood surrounding it, or one having a hole in it.

Relations Existing Between the Dealer and the Building Contractor

The Question of Contractor's Bonds and the Security Given by the Lumber Dealer

By "The Old Retailer"

WHEN we come to dig into the matter of the retail building material dealer's relations with the contractor, we find that the connection entails the developing of many things which do not appear on the surface. The relations of a dealer with a city contractor and a country town contractor have much in common, but they differ very much in the character of their requirements. The business of the city dealer is practically dependent on the contractor, and, to some extent, on the architect, also, and therefore his obligations to the contractor are increased accordingly, while the country dealer, with his large proportion of direct selling to the consumer, is relieved of much of the dependent character of these relations and consequently he is under less obligation.

It is a well-known practice in the cities that in the letting of large contracts, the contractor is required to give a bond, and in many places this is also required on private contracts of a smaller size. As a rule, nowadays, the contractor gets this bond from a regular bonding company and pays for the premium charged. This is all right so far as its affecting the dealer who is furnishing the articles, but the bond company goes farther than this and requires an indemnifying bond to insure them in case the contractor defaults on the job. Here is where the city dealer comes in for an experience that rarely happens to a retailer in the small country town.

To get someone to sign this bond, the contractor naturally thinks of the building-material man who has sold him the goods and therefore is a sharer with him in the profits of the job. If this impulse leads him to ask for the favor, he will, of course, want the dealer to grant it. If he is refused, an unpleasant feeling is created right there and then, and it probably will be the last bill he will be inclined to purchase of that particular dealer.

Some who will read this doubtless are familiar with these contractors' bonds, and probably some have paid pretty liberally for the knowledge so obtained. If you have, it's "never again" for you until, perhaps, there comes a time when the prospect of a good, fat profit will lead you to break the resolution made while in a pessimistic mood. With most men, one such experience is sufficient. I have no means of knowing to what extent this practice of going security for contractors is indulged in by the building material dealers, but doubtless some are doing it, but more for the reason of being under the stress of competition than because of favoring it.

It may be, too, that the increased business obtained through signing these bonds is such that the profits so gained more than compensate for an occasional loss. Some dealers will not sign them as a matter of principle, others who perhaps would if given the opportunity which has not yet been presented, while others have taken warning from the experience of those who have been "stung" by not following their better judgment in refusing to sign them.

It is doubtless true that the idea of signing a contractor's bond meets with less favor among the country town dealers than with those in the cities where they are more dependent on the contractors. The class of buildings that have been common in the country places have not been of the character as necessitated the giving of a bond. The owners usually went their own security. About the only occasion when a contractor has been required to give a bond was when he took the contract for a public building, and in this case the law made it a necessary feature of the contract. But, with the increase of a better class of buildings in the farming districts, there will no doubt be more of these

In this article the author takes up the vital question of the dealer going security for the contractor by signing his bond and the results often accruing from such a course.

The country dealer is less liable to loss through signing the bond for a contractor than the city dealer because he has better facilities for knowing where the money paid on the job goes and also in seeing that it goes for just what it is intended.

But one may ask if the prospective profit is worth the risk. That must be answered by the dealer in the light of his knowledge of the man for whom he signs a bond and the conditions surrounding the job involved.

It should be a good course of procedure for members to a partnership to agree not to sign their individual names to any obligation in which the firm is not concerned.

When a consumer ships in a bill of lumber without the dealer having any previous knowledge of his intention to build there is very likely to be trouble.

security bonds required. However this may be, the country dealer who goes on one of the bonds is not so liable to loss as the city dealer because he has better facilities for knowing where the money goes that is paid on the job and seeing that it goes for what it is intended. This should be done in all cases, bond or no bond, but with the going security for a contractor, the dealer will be more apt to exercise a closer supervision of the money paid on the contract, and, furthermore, it should be distinctly understood beforehand and made a matter of arrangement between the dealer, the contractor and the owner, that all money must be applied first to paying for materials and labor.

Under What Conditions Bonds Might Be Signed

I would not sign a bond of this kind, anyhow, but if I did I would insist on such an arrangement and be particular in seeing that it was carried out. Then, if perchance there was a loss, it would be minimized. This is absolutely necessary, for it is so obvious that where a contractor sees the cost of the job going beyond his estimate, he is going to save his own interests if possible.

There is more or less argument to be said for and against this question of dealers going on contractors' bonds. It is wholly a personal matter with any dealer whether he adopts this policy or not. There are many things business men have to learn by experience, and the nature of this generally determines the course of action in deciding on any policy. A dealer who has suffered no loss in such backing of a contractor will go on signing bonds for him. On the other hand, if he "gets stuck" on one, he will swear off on any more such experience. One thing is sure and should not be forgotten: The signing of such a bond is, first of all, in the interest of the contractor, and practically the whole risk falls on the dealer, for, if there is a loss, the contractor is unable to pay it. The usual business credit which the dealer gives the contractor ought to be enough without taking on an additional risk over which he has little or no control. Doubtless some dealers have been led to go on bonds for the reason that if they didn't, a competitor would, and thereby take the business away from them.

Is the Profit to Be Gained by the Retail Dealer Worth the Risk He Takes?

The question then arises, "Is the prospective profit worth the risk of the chances taken on the contractor's success with the job?" Of course, there is always a certain risk in selling material for every credit sale is a loss until it is paid for, but is it good busines policy to assume a risk that is unnecessary and without a corresponding profit? Is it really a good reason to do it because a competitor will. Where there are but a small number of dealers in a place, it seems to me it would be no great difficulty in getting them all to agree not to go on any contractor's bonds and the common distaste for anything of the kind would automatically operate to prevent any one of them from breaking the agreement. The adoption of this policy by all would not act to restrict any building whatever. The same amount would be done whether they went on the bonds or refrained from signing them.

The Business of the Bonding Company

If a bonding company wants this class of business, let it take all the risk and have the contractor pay a premium large enough to cover it. As it is, the company takes little risk because this is protected by the indemnity bond. Therefore, why should a lumber dealer put a risk on his business to make safe the interests of a bonding company? The question naturally arises: "If a dealer signs indemnity bonds, why should he not instead sign the original bond and have the contractor pay over to him the premium for it?" This would, in a measure, pay for the risk taken. Another thing on this line: "If a lumberman takes all the risks for the faithful completion of a building, why doesn't he go to work and contract for it in the first place and thus secure the profits?"

Great Care Should Be Exercised

Before leaving this subject of contractor's bonds, I want to say I believe it to be a safe proposition for business men to refuse to sign any bonds of this character and I would go farther and include the going security for other parties in the form of signing joint notes or indorsements where it is done simply as a matter of friendly accommodation. If any one is inclined to do this, they should not do it unless they expected to pay what they are going security for, and it would be well if they think of this before signing and not afterward. A good idea, too, is for the members of a partnership to enter into a written agreement with each other not to sign their individual names to any obligation concerning matters in which the firm is not interested. Such agreement would serve as a good excuse for declining to go on a friend's note at the bank or a bond for a public official.

What Mail-order Concerns Are Doing

Some of the mail-order concerns who are dealing in building materials are making a good deal of effort to induce the carpenters-contractors and builders to co-operate with them in selling material bills direct to the consumer. Their scheme is to get every carpenter to work with them on what they call "our co-operative profit-sharing plan," which means, as expressed in their circular, that "you get the concessions on all open mail orders, as well as estimated bills sent us by you direct, or on all goods ordered by others in your locality, either direct of us or through you, where you have recommended or helped influence the business our way." There is much more in the circular explaining the details of the several concessions, but what is quoted is the substance of the plan. The discounts are from 2½ per cent to 5 per cent, and on houses complete selected from their plan book $20 each.

The wording of these circulars is well calculated to excite the attention of the carpenter working by the day as well as the small contractor whose jobs are often few and far between and the temptation is

strong to induce them to make a little extra money by using their influence as the circular suggests. The local dealer offers them nothing of this kind and they naturally think they ought to have something for their influence in turning business to his yard. So it is not strange that some of them will "fall for" suggestions like this: "You are entitled to payment for your time, labor and advice. You are asked to make out lists, specify grades of material, take measurements, quote prices, etc., and it's only right that you should receive something for your time and trouble."

Some Contractors Are Not on Good Terms with the Local Dealers

There is generally in every town one or more carpenters and contractors who are not on very good terms with the local dealers, usually for financial reasons, and this is the class that are more liable to be caught by an offer from an outside concern that will give them a chance to "get back" at these dealers and show their independence of them and in their contact with people who are asking information about building matters. They are not likely to say anything favorable to the local lumbermen. Even the regular contractors who are customers of the dealers are more or less affected by this insidious influence to use these offers for the purpose of persuading them to be more lenient in the matters of prices and credits. It is sort of a club they hold over them. There is never a situation of this kind, though, but what has its counteractant.

The Attitude of the Customer

If a customer comes to a dealer and tells him that his carpenter knows a place where he can buy his lumber bill a good deal cheaper and he will get it for him and the dealer is conversant with the reasons for this, he can inform his customer of the fact that the carpenter will receive a liberal percentage of the amount of the bill for his influence in securing it for the mail-order concern. Of course, the carpenter has not said anything to him about this part of the deal and, therefore, it naturally sets him to thinking whether, after all, the carpenter was as loyal to his interest as he had tried to make him believe. When a consumer is convinced that another party is "working him" for his own financial profit, as in a case of this kind, it is going to make him angry, particularly when he supposed he was getting all the profit from the transactions. When he learns this, it won't be hard to convince him also that neither he nor the carpenter knows anything of the character of the material that he will get, and so it will be for him like "buying a pig in a poke," and the average man going into a deal of this kind wants to be more certain of what materials he is going to get than the reliance on the word of a carpenter who is going to make a profit on his purchase.

When the Dealer Fights Competition

Whenever a dealer discovers any of this outside figuring going on, he should go after the matter with hammer and tongs and beat down all such competition and any bill so figured should be sold by him even at a loss if necessary. It is bad enough when a consumer takes it into his head to monkey with a mail-order house, but it is doubly so when the contractors and carpenters get the notion of cutting loose from the local dealers for an extra profit to themselves.

Value of the Card Index

Very often a consumer ships in a bill of lumber without the dealer having any previous knowledge of his intention to build. There is no good excuse for his not knowing it. An index card system should be a part of the business machinery of every lumber office, especially the country yards, and every owner of a building in town and every farmer should be sounded from time to time as to their inclinations and intentions to build or otherwise make improvements. A card record of this information would serve to keep the dealer posted on what everyone was going to do in the way of building improvements in that locality. On the other hand, if he waits for such information to be given him in the usual casual way, he must expect now and then to be shocked by someone shipping in a bill without saying anything to him about it. The modern dealer should take the place of the contractor as the principal source of information pertaining to building matters in his particular locality.

Collecting Accounts

The near approach of the close of the year brings the unpleasant duty of making an extra effort to settle and collect the accounts of the contractors and those of other small jobbing mechanics in the building trades. With the average dealers, these accounts have been dragging along from one month to another. Some money has been paid on them, but with some few exceptions there has always been more or less standing on the books against them all through the season. As a rule, dealers do not like to be too urgent in pressing collections against this class of customers. They want their influence for trade and therefore hesitate to inject any disturbing element in their relations, such as pushing them to pay their bills.

Why Some Are Slow Pay

The jobbing mechanics and tradesmen generally make little more than enough to support their families. If they have had a good season's work, they have perhaps a little left to carry them over a part of the winter at best, and so, as the work slackens up, they are inclined to hold on to the surplus they have saved and avoid paying out on an old account any more than they can help. The pressing needs of the present are more to them than the leftovers of past accounts. Of course, they intend to pay them sometime out of a good job. That hope seems in the future, but just now there is fuel and clothing for the winter to buy, and, besides, the Christmas holidays are near by. This entails the spending of more money than usual and consequent inability to pay more on the account owing the lumbermen. These men don't visit the lumber yard as

often as they did in the summer because they dislike to be dunned. Some will dodge meeting the lumberman for the same reason when they see him coming on the same side of the street. This and the dealer's reluctance to dun him are the principal reasons why this class of accounts is carried over till the next year. In large measure, this is the dealer's own fault. He knows the class of men he is dealing with and their limitations, and, therefore, he should be firm in requiring of them prompt settlement of their bills instead of letting them string along and pay at their convenience.

It is a mistaken idea that some dealers have of fearing to lose a carpenter's trade by insisting on prompt settlements, for, as a matter of fact, he is more apt to trade at a yard where his bills are paid than with another that has an old account hanging over him, and so my suggestion is, buckle down to collecting your contractors' and tradesmen's accounts and never mind your future relations.

Anent Transit Cars

We note in our worthy contemporaries considerable discussion as to the "transit car evil." The writer believes that no matter what the transit car may have been at times in the past, it is a blessing at present, and, we are not sure but that, so far as the retailer is concerned, it is never an "evil." Incidentally it no doubt does occur to the retailer just why something that is beneficial to him should be called an evil. If it be an evil to the wholesaler, then it would be proper to so state. We take the position that on the whole it is an accommodation to the retailer and of decided benefit to certain mills.

All mill owners can not be millionaires and need to cash their product as often as possible. It is their right to do so. Again, it is likely that many mills of smaller import have on hand four or five cars of a certain kind of lumber. Let us say it is ship lap, and their order files are blank on that item. There are many retailers who want ship lap; they have placed orders with certain mills for ship lap, but cars cannot be had in which to ship. Why should not the retailer be given the opportunity to buy what he wants, and particularly when it is already loaded and in a car, headed towards his lumber yard. Is it morally right for the wholesaler who cannot ship the ship lap to say the retailer cannot have it? Of course not. He will not complain of that. The first mill by the transit car system secures an order for his ship lap and turns it into money.

Of course the larger mill owner may say, it disturbs the market. Maybe it does at times, but we are of the opinion it does not. If the market is so sensitive that a few transit cars will control it, then it will decline anyway. At any rate the right of the transit car manager and the retailer to contract should not be disurbed. The writer is speaking, of course, rather from the retailer's standpoint. But whatever is for the retailer's benefit is, in the long run, for the benefit of the wholesaler. The retailer is an auxiliary of the mill. Their real interests are closely co-related.

In these times, at least, of car shortages, when many mills have more orders than they can fill and when retailers cannot promptly supply themselves, we do not believe the transit car is an "evil."

A DEALER.

Materials Used in American Lake Cantonment

Supplementing the information contained in our last issue regarding the army cantonment at American Lake, Wash., it may not be without interest to mention the quantities of some of the more important materials used in the work. We therefore give the following tables:

Building Material	
Lumber	55,000,000 Feet BM
Sash	84,900
Doors	13,050
2-Ply Roofing Felt	78,644 Squares
1-Ply Roofing Felt	16,933 Squares
Building Paper	15,586 Rolls
Wall Board	519,560 Sq. Feet
Cement	10,010 Bbls.
Sand	4,751 Cu. Yds.
Gravel	5,690 Cu. Yds.
Nails	7,426 Kegs
Heating Material	
Radiation	82,584 Sq. Feet
Steam Boilers	147
Stove pipe	33,771 L. F.
Elbows	3,924
Electrical Material	
Lamps	20,000
Drop Cord	57,000 Feet
Fuse plugs	16,000
Wire cleats	240,000
Screws	545,000
Insulated wires	1,300,000 Feet
Water Pipe	
Wood Stave pipe 6" to 14"	95,000 Feet
Iron Pipe ¾" to 2"	125,000 Feet
Sewer Pipe	
Vitrified 6"-24"	115,000 Feet
Concrete 6"-30"	50,000 Feet
12" Steel Pipe	568 Feet

From the above figures the reader may be able to form a slight conception at least of the magnitude of the work at this Western cantonment.

There were cut from the National Forests in the past fiscal year 604,920,000 board feet of timber. Of this amount 119,483,000 board feet was cut under free use privilege by 42,055 individuals. In all, 10,840 sales of timber were made, of which 97 per cent were under $100 in value, indicating the extent to which the homesteader, rancher, miner, small millman and others in need of a limited quantity of timber draw upon the forests.

Shuttle factories and other manufacturing plants use more than seven and one-half million feet of dogwood annually in this country.

Some Suggestions for the Dealer's Homecraft Department

Constructing a Medicine Cabinet

By John Wavrek, Jr.

ONE of the indispensable pieces of furniture in a home is a medicine cabinet. There is always an accumulation of toilet articles and medicines in a bath room which prove to be considerable of a nuisance in case there is no receptacle to hold them, especially where there are little children in the home is it a menace to have medicines standing around where they can get at them.

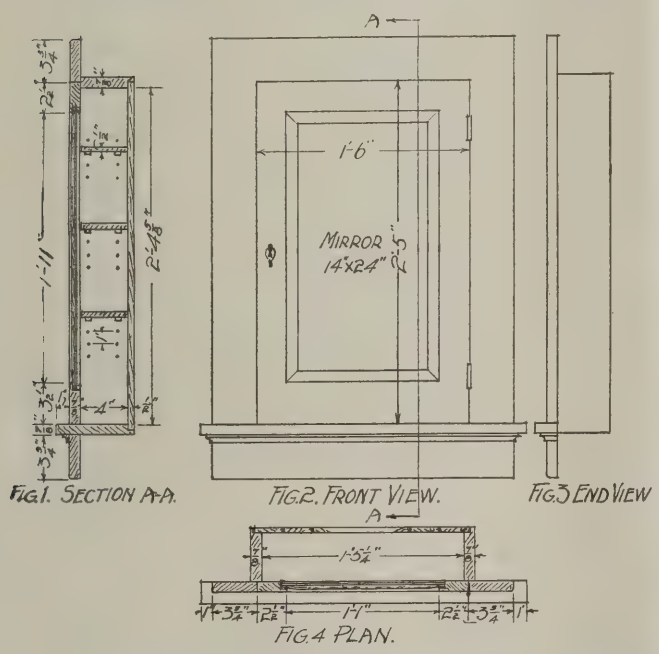
If there is no medicine closet in the bath room it is a matter of no great trouble to install one. The sketches show such a cabinet intended for a 4 in. stud wall. It can be made wholly of small pieces such as collect in a planing mill. It does not matter very much what kind of wood is used because a bath room is usually painted and as there is no wide surface exposed anywhere it is possible to use either white pine, poplar, yellow pine, cypress or any hard wood.

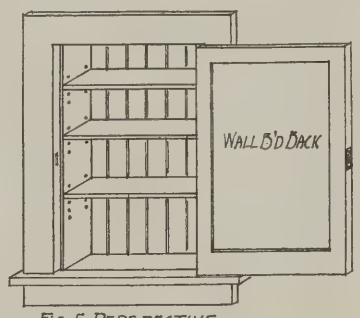
The largest pieces are the sides, being ⅞ in. x 4½ in. x 2 ft. 6⅜ in. and the head piece which is ⅞ in. x 4½ in. x 1 ft. 6¼ in., surfaced four sides and rabbeted ½ in. x ½ in. on the back edge wherein is placed a back of ½ in. tongued and grooved wainscotting. The stool is ⅞ in. x 6½ in. x 2 ft. 3½ in. rabbeted like the sides and head and is also slightly nosed on the front edge and ends as here shown.

Having made the sides, head and stool the sides are bored for the metal shelf supports about 1 in. on centers and after the sides are dadoed for the head and stool, the case is nailed up, and is then ready to have the back put in.

The shelves, of which there are three, are made ½ in. x 4 in. x 1 ft. 5⅛ in. s 4 s. ⅛ in. play is allowed in order to shift them easily to the different positions required. The door is next in order, the size being in this case 1 ft. x 6 in x 2 ft. 5 in. x ⅞ in. thick, made with opening for a 14 in. x 24 in. mirror. The stiles and top rail are ⅞ in. x 2½ in. and the bottom rail is ⅞ in. x 3½ in. wide.

The framing may be accomplished either with mortise and tennon or with dowels. There is a rabbet ½ in. x ⅝ in., provided for the mirror and the back for the mirror. The back may be kept in place by means of a small bead ¼ in. x ¼ in.





CONSTRUCTING A MEDICINE CABINET AS DESCRIBED BY MR. WAVREK, JR. SCALE ¾ IN. TO THE FOOT

It is customary to trim the medicine cabinet with the same style of trim as is used for the door and window openings. In this case it is ⅞ in. x 3¾ in. and is put on reverse from the door or window trim, the reason for this being that the back edge is the same thickness as the door, which is fastened thereto by the hinges.

An apron is placed below the stool of the same style as the other trim. A ½ in. x ⅞ in. cove being added completes the finish of the medicine closet.

Fig. 1 of the sketches shows a section on the line A-A of Fig. 2 which represents a front view. This section gives a clear idea of the construction vertically. Fig. 4 shows a cross section looking down the top. Fig. 3 shows the end appearance of the cabinet before placing it in the opening in the wall.

The wall opening may be made one or two inches larger each way than the size of the case. The wide

trim covers the opening completely, and makes a very neat appearance.

Fig. 5 is a perspective of the cabinet and gives a view of the interior.

The pieces required to make this medicine cabinet are as follows:

2 pieces ⅞ in. x 4½ in. x 2 ft. 6⅜ in.
1 piece ⅞ in. x 4½ in. x 1 ft. 6¼ in.
1 piece ⅞ in. x 6½ in. x 2 ft. 3½ in.
3 pieces ½ in. x 4 in. x 1 ft. 5⅛ in.
8 pieces ½ in. x 2½ FC. x 2 ft. 5⅝ in. "V" beaded T. and G.
2 pieces ⅞ in. x 3¾ in. x 2 ft. 8¾ in. } Trim.
2 pieces ⅞ in. x 3¾ in. x 2 ft. 1½ in. }
1 piece ½ in. x ⅞ in. x 2 ft. 6 in. cove.
2 pieces ⅞ in. x 2½ in. x 2 ft. 5 in. stiles.
1 piece ⅞ in. x 2½ in. x 1 ft. 5 in. top rail } Door.
1 piece ⅞ in. x 3½ in. x 1 ft. 5 in. bottom rail }
1 back 14 in. x 24 in. wall board.
1 mirror 14 in. x 24 in., 1 lock, 1 pair 1¾ in. x 2 in. hinges.

Duties of the "Forest" Regiment

The 20th Engineers (Forest) Regiment will perform necessary and immediate service to our army in France—that of securing an adequate supply of firewood for heating and cooking purposes for the vast body of men all of next winter; to cut great quantities of poles for telephone wires, for barbed wire entanglements and for stakes used in the retaining walls of trenches. They will cut railroad ties, rough bridge timbers, props in mines and tunnels and produce wood for a thousand other emergency uses.

"Such timber is second only to ammunition and provisions in the work of a successful army," says a statement just issued by the Committee on Lumber of the Council of National Defense. "It has been suggested that a certain amount of lumber can be shipped from this side as deckloads and dunnage of vessels, and the committee is looking into this question to determine the volume of tonnage able to be secured. Even with the best endeavors, however, in the line of cutting timber abroad and shipping it on vessels from this country, the demand will far exceed, for some time at least, the supply."

The Retailer's Besetting Sin

By C. E. Davidson

The besetting sin of the average retail lumber dealer is his penchant to "take a shot" in some scheme of chance, some new line, the intricacies of which he knows nothing and at which experienced men have failed. To this he gives money and time for its advancement for a short period until finally he extricates himself, a wiser and a poorer man.

Just why the retailer is apparently caught for more of this kind of "blue-sky" enterprises than the average business man, is because he can usually produce a few hundred or a few thousand dollars. He is generally a promiment man in his community and is a natural prey for all the "blue-sky" merchants, so called. Not but what some of these "merchants" are not themselves sincere—they are, but they have a zeal, without wisdom.

I recall that several years ago while attending an annual meeting of the Illinois Retail Dealers, the absence of some speaker on the program left an open hour. Nat Holden of Danville was then president. John Alexander and a few more of us—Joe Paddock one of them—were standing in the hotel lobby pondering upon what we should do to fill the open hour. It was suggested that we take as a subject, "How I Lost It." One of the party said, "What do you mean," It was explained that nearly every one present "had dabbled" in various schemes, and in every instance lost money, and it would make an hour of fun for the president to call upon each member for an impromptu statement of just "How He Did Lose It." So it was agreed.

Mr. Holden, upon reassembling, prescribed the program—a sort of a dose, which, of course, he must take himself. He spared no one. The fun grew. One had lost in a gold mine, another in oil "wildcatters," another in cold-storage poultry and eggs, another in brick plants, another a merry-go-round, and one had come into possession of a circus, he having bought, at first, a minor interest. He took the whole circus for his lien; then he did have a job on his hands. It took all the old horses to feed the lions, and all the hay in the country to feed the elephants. A little later another creditor came along and replevined the whole "caboodle," which relieved the retailer. It is needless to say he never tried to gain possession of the circus, but counted the man with the replevin writ a real friend.

Maybe other lines of tradesmen dabble in outside lines as much as retailers, but I think not. They make some money in the lumber business, which they understand, and then lose at least a part of it in some other line about which they know nothing. There is a human instinct which, though false, gives color to the Irish saying, "the fields are greener far away," with a consequent desire to launch out into the unknown. Of course, true wisdom would distate "don't do it," but we suppose 'twill be ever thus.

Cypress manufacturers have offered to produce some of the extra large size timbers which are difficult to obtain in pine. "Every piece of cypress possible of conversion into shipbuilding timbers will be so utilized," said George E. Watson, secretary of the Southern Cypress Manufacturers' Association, following a canference with lumbermen and representatives of the government. Cypress is said to be especially adaptable to the production of what are known as "Flitches."

It has recently been discovered that gum lumber immersed in pure gummed spirits of turpentine lasts many years longer when exposed to open air. The usual method of treating the lumber is to give it three coatings and allow it to thoroughly dry after each one.

Reports from Texas are to the effect that C. L. Johnson, lumber dealer, with yards at Waco, Gatesville, Hamilton and Ireland, has sold his entire holdings to W. F. Barnes & Sons of Lampasas.

Adopting "Slide" Publicity to Increase Your Building Materials Business

Suggestions Which the Progressing Retail Lumber Dealer Will Find Valuable

By Ernest A. Dench

"WHY do they give us books instead of pictures?" was the remark I overheard after a photoplay burdened with explanatory matter, had been run off the screen. This adequately expresses the opinion of ninety-nine out of every hundred motion-picture patrons.

The same is true of slide advertising, which, in order to prove effective, must be in complete harmony with the surroundings. Your announcements should live up to the "every picture tells a story" slogan. The greatest obstacle in the way of the widespread adoption of illustrations in newspaper, street car and billboard advertising is the expense. Artists, cuts and color printing are costly for local purposes, and it is only national advertisers who find them a profitable investment. They are able to use them in large quantities, consequently greatly reducing the cost of production. It is for this reason that so many building materials dealers have to remain satisfied with plain announcements.

But there is absolutely no excuse for the dealer in building materials using such copy on the motion-picture screen, for it costs as much for a slide without a picture as it does with one. And, what is more, you can indulge in the luxury of colors, since no slide manufacturer worth his salt turns out designs in black and white.

There are other compensating advantages, too. Children are keen "movie fans," and if the eye is appealed to they can grasp the purport of your message. The picture accomplishes this as easy as kiss your hand, and as most children delight in telling those at home what they have seen, your announcement will be brought to their notice in an indirect way.

Have you considered the foreign element as well? With their smattering of English, it is a moot point whether they can comprehend a plain announcement slide. The picture, however, knows no language, so you have them immediately interested.

The photoplay author, in calling upon explanatory matter to help along difficult stages of his story, has to bear in mind that each word means one foot of film. What you should realize is that in the limited time your slide occupies the screen it has got to sink in, and the clever picture with one or two snappy sentences thrown in for good measure will get across, while your neighbor is extravagantly using up the English language.

The slide companies put out stock designs. A typical subject recently issued by a New York concern showed a builder finishing the roof of a house. At the side was this message:

"Capping the Climax.
"A Good Shingle 'Tops Off' a Good Building.
"Whether you Want Building Materials or Excellent Shingles, This Is the Place to Buy Lumber."

Another depicted an architect instructing the master builder on the job. The wording was as follows:

"Your Architect Will Have No Trouble in Seeing That His Specifications Are Complied with if Your Orders for Lumber are Lodged with Us."

All you have to do is to fill in your name and address at the bottom of each slide. Stock slides cost from 35 cents to $1 apiece.

The slide manufacturer, in preparing a stock slide for the building materials trade, has to make it apply equally well to dealers throughout the country. Occasionally, however, he slips a cog, but this is not altogether his fault; you are alone to blame for purchasing a slide which misrepresents your business. It may, on the other hand, just fit in with the individual needs of your competitor.

Photoplay audiences should not be disillusioned;

Here are more interesting details for the retail lumber dealer who adopts the novel scheme of advertising his business by means of photo-slides in the moving picture theatre. The results, when the scheme is judiciously managed, should readily prove the value of the method of bringing your business to the attention of the local trade at least.

When ordering your slides select those which apply truthfully to your own line of business, and use a good series or serial rather than a single stock slide, while in telling the story bring in the humorous as well as the educational.

Secure exclusive rights for your own town and use care in selecting a theatre near your own establishment for the display of your slides.

There are many little points which the dealer can utilize to advantage, and the man who is wide-awake to his opportunities will profit accordingly.

the screen must be kept free from abuses, for once spectators discover that you are in the habit of misrepresenting the facts, they will evince less interest in your announcements. Therefore, when purchasing a stock slide let the deciding factor be: "Does it apply truthfully to my own business?"

Use the Stock Slide

You can use the stock slide and still give photoplaygoers the impression that you are decidedly distinctive. The motion-picture exhibitor believes in hiring his screen to one advertiser in each trade, consequently if the slide has been prepared especially to suit your trade there is no fear of overlapping.

The only way a person could discover that your stock slide is used by a competitor would be if he were a patron of more than one motion-picture theater. Here, again, you would score a brilliant victory. The fan, not being in "the know," and having seen your announcement first, would proclaim you as the originator. So if you see a fellow dealer using a stock slide which takes your fancy, do not go and do likewise. Select something different.

Hard to Maintain Interest with Single Stock Slides

It is hard to maintain the interest with single stock slides, but with a good series or serial you can actually make folks look forward to the next design. It is essential to secure the exclusive rights for your town, which is now possible since a number of excellent series have been produced. This concession, which may be obtained by paying an additional fee, is important because the slides can be filled in to suit almost any business.

In a series of slides you can put over an entertaining story, humorous in parts and educational in that you point out why folks should purchase their building materials from you. A clever scenario writer-artist and skilled slide manufacturer can do wonders for you in this connection.

Stock Slide Cannot Present the Personal Touch

While the stock slide covers a wide area, it cannot be extended to present the personal touch between the building materials dealer and prospect. Its versatility ends just where it is essential to present the intimate appeal which counts for so much.

What is that elusive something, the personal touch? To my mind, it is by introducing yourself to your prospects.

Where is your establishment located? True enough, you will not neglect to include your name and address on the stock slide, but first impressions are lasting. It is my intention to advocate the adoption of what I may term the photo-slide for want of a better name.

On your visits to the local photoplay theater you will have noticed that the exhibitor is prone to using announcement slides of forthcoming attractions. On this kind of slide an important scene is reproduced from the picture and tinted in natural colors, while the blank space is used to good advantage with a brief description of the film.

Planning an Advertising Campaign

In planning an advertising campaign along similar lines, it is up to you to have some photo slides specially designed to conform with your individual requirements. The best way by which to present the personal appeal is by having a photograph taken of the exterior of your premises. You can then forward it to a reputable slide manufacturer, who will add the desired description, reproducing the whole in natural colors.

The slide should have two marked effects upon spectators. First: Visualize for them exactly where your place is situated so that they may recognize it on sight. Second, leave a favorable impression.

Have Your Slides Shown in a Suitable Theater

In selecting the most suitable theater for your slide announcements, several points have to be taken into consideration. Suppose you are situated in a residential section. In most towns, at least, the down-town photoplay theater attracts folks from all sections, so should you decide upon a down-town show for your announcements, you are paying for scattered circulation. Not only that, but the exhibitor rates the advertising value of his house at a much higher figure. Few towns possess local newspapers which circulate exclusively in one section, because as you draw the bulk of your business from the surrounding blocks, it is advisable to pick out a photoplay theater within a few hundred yards from your establishment. This should be comparatively easy because such conditions exist in most towns.

Motion-picture theaters may be divided into two general types: One is the nickeldrome, which has been converted from an empty store and seldom accommodates more than five hundred. It usually shows the oldest films and caters to a cheap patronage. "Circus" advertising proclaims this fact in nine cases out of ten.

Patrons Prefer a "Classy" Theater Building

Although the motion-picture theater is a democratic institution, the well-to-do working classes prefer to patronize the classy building which has been specially erected for motion pictures. It is not because they refuse to associate with their poorer brothers and sisters; quality is the deciding factor. For five or ten cents more they see a longer and better program amid more comfortable surroundings. This modern kind of show generally accommodates at least a thousand.

So far, so good—the rest depends on the managerial policy. The best way to discover this is by visiting a desirable theater as an ordinary patron, and if your trade is already represented on the screen, the theater is unavailable for the time being. This may strike you as peculiar, since no newspaper grants a monopoly, but it is the custom in slide advertising.

The healthiness of a newspaper may be judged

by the volume of advertising it carries, but it is the reverse in the case of the motion-picture theater. The fewer the slides shown, the better, as time is precious, and if the exhibitor is to give each advertiser the service for which he pays, he can only do so when his slides do not exceed a dozen. When the number is in excess of this, the operator usually whips each one off before spectators are able to read it.

Length of the Contract

When you have satisfied yourself on all these matters, you can interview the exhibitor, who will probably suggest a six months' contract. You may be averse to this, but your signature is justified in view of the fact that the rental, which will vary from $5 to $10 a month, according to size and location of the theater, will work out more cheaply than on the weekly basis. It will also afford you protection in that your competitor will not have an opportunity to put one over.

One insertion of an advertisement seldom produces results, and the same is true of slide advertising. You have simply got to hammer the facts home to the public, for the constant seeing of your name will go right home. Another thing, do not neglect to change your slide frequently.

If you are running a series or serial, however, you must remember that most theaters change their programs daily, and only a proportion of patrons attend regularly. Some days the program does not appeal to them, so they favor the rival show, and you therefore could not expect to have many follow same from beginning to end unless you took system in charge.

Ordering Stock Slides

Every now and then a photoplay producer releases a series or serial. It is booked by the exhibitor, who arranges to show it at his theater in weekly installments. Those of his patrons—and they constitute the majority—take good care to be present each week on the evening set aside for the installment. So if your slide series or serial started off with the photoplay it would be seen in its entirety by most folks. Therefore, when planning your slide series or serial, arrange with the exhibitor to run it simultaneously with the film production.

Then there is the all-important matter of ordering the stock slides. You will undoubtedly prefer to purchase these one at a time, as new designs are constantly appearing. The slide manufacturers find that there is so much correspondence involved in executing orders of less than a dollar that they prefer them to be given to the exhibitor who orders slides in profitable batches. It also saves you the trouble of ordering.

As Seen by the Man on the Roof

Cal, the Carpenter, Says

Try to give the customer satisfaction, not building material.

What we need in this country is more paytriotism.

A little building material can make a material improvement.

When a man comes to borrow trouble lend him encouragement.

A good many bad shingles are laid to the weather.

Making a good job is cheaper than making a job good.

Many a poor fish has been caught on a line of credit.

A prophet ought to believe in prophecies and a contractor in profits.

There are few mistakes on the man who is on the job.

Let us hope our troops advance as rapidly as our prices.

The world do move, in which it often differs from a freight car.

The place to save money is in a bank, not in a tool.

The architect is one man who doesn't dare to take a chance in a drawing.

Some of us have so many bills to meet that there are mighty few meetless days.

There can't be smoke without fire, especially if you smoke around an excelsior factory or a garage.

You can't make a cut with a dull chisel; and you can't make business with a dull ad.

Some of us, if we hang up our stockings this year, will have to do it at the pawnshop.

To succeed in business a contractor used to have to be a good mixer, but now he has to have one.

The laborer not only believes he is worthy of his hire, but that the hire ought to be higher.

There is a good deal of building mention in the Bible, and a good deal of the Bible mentioned in building.

There is nothing new under the sun. We used to have the log blockhouse, and now we have the cement block house.

You may think something else will answer, but the owner may be about as well pleased as when the wrong 'phone number answers.

Sometimes a man's left hand doesn't know what

his right hand doeth, and sometimes his foreman doesn't know what any of his hands doeth.

Remember that a location it is easy to get material to isn't nearly as important as one to which it is easy to get customers.

Good Things

People are always looking for "good things" to bet on. Here are a few good things not to:

The Giants.	Arrival of a car of steel.
A horse.	The price of glass.
A jury.	A promise to pay you on the first.
A straw vote.	A weather prediction.
Woman.	Which way the manager will jump.

Three other things not to bet on: kings.

Here are a few things that are perfectly safe to bet on:

That the dentist will tell you yes-you-do-need-a-few-fillings.
That it will rain the day of the Builders' picnic.
That the taxes on the new property will be higher than you expected.
That the paint you thought wouldn't last, won't.
That someone else has a prior lien.
That the busted bank will pay 6 cents on the dollar.
That your lawyer will show you where the court was wrong.

Conservative

It is all right to be conservative, but there is such a thing as being too much so. If you have something to do, whether it is making war or whatever it is, the best way to do is to do it at once and up to the handle. Some of these careful, go-slow people remind me of a man we used to have in our town when I was a boy. When a board was a foot too long, he cut six inches off each end.

Breaking Up the Debating Society

"The rural telephone must be a great convenience," said the city visitor. "Now your wife can call up the store in town any time she wants to do so."

"That's the trouble with the gol-darned thing," answered Si. "A fellow don't any more'n git sot, than his wife calls up for him to come home."

Poems of Pessimism—II

I like to be a pessimist.
  I'd hate it always being
A smiling yessir yessemist,
  With ev'ryone agreeing.
I like to spread a gob of gloom
  In every direction.
I try to do a job of gloom
  Without an imperfection.

For then, no matter *what* occurs,
  It couldn't be a worse un;
When trouble in a lot occurs
  It doesn't jar a person.
I know that something terrible
  My orbit now is nearing—
The way to make it bearable
  Is something fearful fearing!

Period Furniture

One trouble with the modern woman is that she so often is an antique.

The Very Idea

"The very idea!" some scoffer will say
  When somebody offers to do
Some task that is old in a different way
  Or something decidedly new.
Columbus declared that the planet was round.
  And Fulton that steamers would go,
And Bell that by wire you could carry a sound.
  But ev'ryone answered them so—
    "The very idea!"

So be not discouraged and be not alarmed,
  Though people may skeptical seem.
Bell, Fulton, Columbus, their critics disarmed
  By going right on with their dream.
And, when they had worked ev'ry obstacle out
  And finished the thing they began,
The world gave a great and unanimous shout
  And cried, "What a wonderful plan!—
    The very idea!"

Some Fellows Just Can't Help But Make Money

POSTMASTER—I hear Lem Chapman, the bricklayer, fell off the roof of the new Methodist church and broke a leg and two ribs.

INSURANCE AGENT—Yep. I sold him an accident policy only two weeks ago, and now this happens to him. Ain't he the luckiest guy?

Blessed Babe A-building

Blessed babe a-building, what is this you make?
A little garden in the sand to try a little rake,
A shelter for your woolly horse, a house for dolly's sake.

Blessed babe a-building, how wonderful they seem!
You see a vision of a Home, and radiant the gleam
Already in your baby eyes—the glory of the Dream!

Home

A hearth whose blaze is red and bright,
And what of all the dark of night?

An honest roof, however plain,
And what of all the wet of rain?

A rocking-chair beside the fire,
And what of all the tasks that tire?

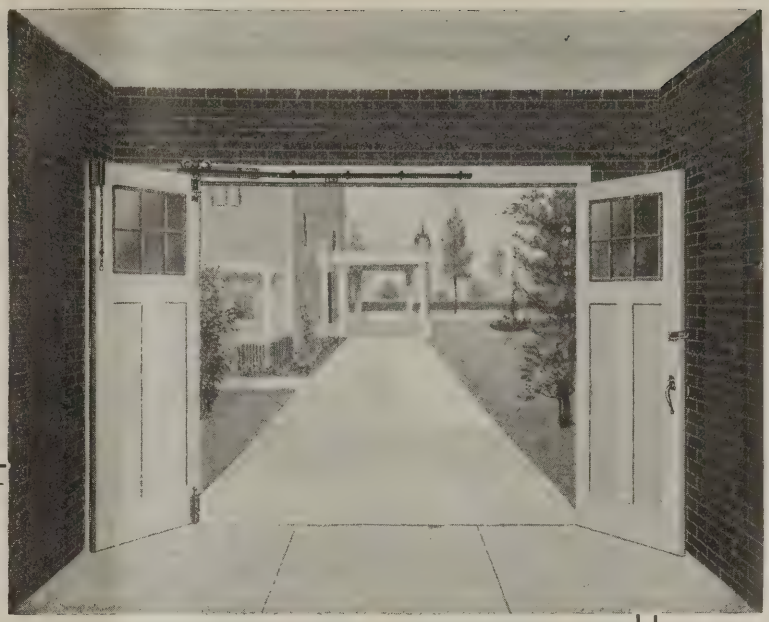
A little home, a little wife,
And what of all the storms of life?

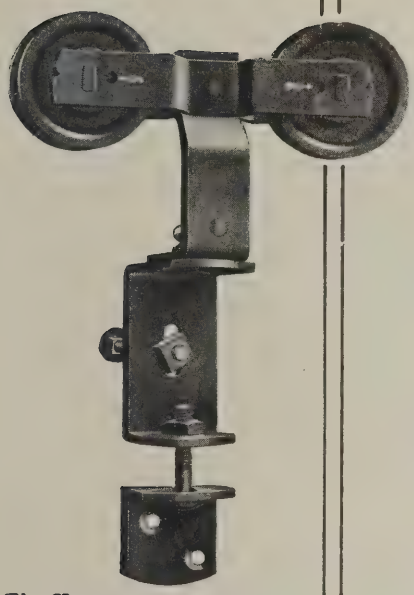
The Man for the Job

"What I want," said General Pershing, "is a man who can take a motor car and find his way over hills and dales, through woods and angling roads, unconfused by corners or curves, among a people who speak a strange language, and still deliver the message to the person for whom it is intended."

"I have the very man for you," replied the Captain. "He used to deliver building material in Boston."

They HANG SWING *and* FOLD→





The Hanger operates on a swivel and turns on the track without sticking or binding in any way



The No. 27 Latch has no complicated parts to get out of order

See how snugly the doors hug the walls

Economy in space is the first consideration in building a garage.

Most garage doors are in the way and take up valuable space.

Not so with the

National Garage Door Set

The NATIONAL is absolutely the easiest working garage door set, as there is no binding or friction. They are guaranteed to work freely.

Doors hung with these sets require but a minimum of space in opening, as they are hung on the inside and fold and slide against inner wall.

It is the cheapest and most substantial set you can offer your customer.

One Door Opens Without Disturbing the Others

Set No. 805 includes: No. 29 Latch; 1 only Swivel Hanger; 6-foot Braced Rail; 4½ pair 4 x 4 inch Jap. No. 505 T. P. Butts; 1 only No. 820 Chain Bolt; 1 only No. 830 Foot Bolt; 1 only No. 5 Pull; 1 only 4½-inch No. 30 Safety Hasp.

No. 806 Set includes the same, except that No. 27 Latch is used instead of No. 29.

Both sets furnished in Japan finish.

Write for full particulars and give dealer's name.

NATIONAL MFG. CO.

STERLING, ILLINOIS

Contractors' and Builders' Show

Chicago Coliseum February 6-13, 1918

This is the new name of the
Chicago Cement Machinery and Building Equipment Show

The Contractors and Builders Show takes the place of the former Cement Show, but unlike the Cement Show this will be a **Complete Exhibition** of all kinds of materials used in the construction of buildings and highways, including asphalt, brick, cement, lumber, steel, stucco, tile, wood blocks, builders' hardware, paints and varnishes as well as contractors' tools and machinery.

This Show will be of the utmost interest and value to architects, builders, contractors, dealers, engineers and manufacturers and you are all cordially invited to attend. **It is your Show.** It will have a stimulating effect on construction of all kinds.

The warring nations of Europe have not ceased building, so why should we?

We need more factories and more homes for our workmen, and building material prices are not coming down.

The following Conventions are booked for the week of the Show:

American Association of Engineers.
American Concrete Institute.
American Concrete Pipe Association.
Central Association of Lumber, Sash and Door Salesmen.
Illinois Lumber & Building Supply Dealers Association.
National Association of Sand and Gravel Producers.
National Builders' Supply Association.

Tell your friends about this and plan to attend and post yourself on all the newest developments in building materials and construction methods.

For further information address

CONTRACTORS' AND BUILDERS' SHOW

123 W. Madison Street, Chicago, Ill.

Builders' Appliances and Equipment

Some Things of Special Interest to Those Having to do with the Various Branches of the Building Business

A Rapid Job of Concrete Work

In preparing for the recent world's series of baseball games in which the Chicago Americans, otherwise known as the "White Sox," took the championship, it was decided to increase the permanent seating capacity of the grand stand in the American League Baseball Park in Chicago by building 1000 additional box seats around the front of the first floor of the grand stand, as well as construct 3000 temporary seats. This raised the permanent seating capacity to 30,000 and the temporary seating capacity to approximately 33,000.



Fig. 1—A Rapid Job of Concrete Work in Connection with the building of additional seats for the Grand Stand at the American League Base Ball Park in Chicago, Ill.

Rapid construction was required as the entire work had to be completed in eleven working days. The job consisted in building four rows of box seats around the entire front of the grandstand, 578 ft. in length, the construction of two new shelter houses, each 30 ft. long by 6 ft. wide with walls 8 ft. deep and a new front foundation footing 3 ft. deep surmounted by a solid reinforced concrete rail 3½ ft. high along the entire front of the grandstand. A base for the concrete work was made back of the front footing by filling with cinders. All metal piping separating the boxes was set into the concrete and concreting was done in alternate sections to provide for contraction and expansion.

The general contract for this work was let to the Standard Concrete Construction Co., 108 South LaSalle Street, Chicago, who used for mixing the concrete two 1/3 Yard "The Standard" Low Charging Mixers. Material was delivered in wagons and motor trucks and distributed along the front of the stand, leaving only enough room to set the mixers between the supply piles and the front footing. The portability of the mixers enabled them to be easily moved along as the work advanced so that the entire operation of delivering aggregates to the mixers and the mixed concrete to the forms was accomplished by hand-wheeling the shortest possible distances.

The picture, Fig. 1, shows the work in progress and illustrates how the mixers were kept close to the locations where the concrete was being placed so that manual labor was reduced to a minimum. A considerable quantity of sectional "forms" was required for the long front concrete rail and the shelter houses, but by moving the mixers along first to put in the footings and then to put in the floor slabs and front rail, the work proceeded so rapidly that it was easily completed within the specified time limit.

"Milcor" Sheet Metal Products

The builder who is interested in sheet metal products will find the new catalog of the Milwaukee Corrugating Company, Milwaukee, Wis., and entitled "Milcor Sheet Metal Products" of decided interest and value, for it illustrates and describes the various types of corrugated roofing and siding manufactured by this concern, to-

gether with the method of application, which latter is an important feature to the builder who is desirous of securing the best results and of informing himself upon accepted methods of construction in this line. Corrugated ridge rolls, wall flashings, lead washers and lead headed nails are illustrated. The advantage of using lead washers is stated to be that their use makes an absolutely water-tight joint on any surface, whether it be concave, convex or flat, and they are declared to practically eliminate the rust which usually first appears around the nail holes in metal roofs, as lead washers do not rust. Drawings of various farm buildings, dwellings and small commercial structures on which metal roofing and siding can be used advantageously are contained. Certified standing seam roofing is illustrated and directions are given for its application, and directions are also given for applying V-crimp roofing. Tools are illustrated and described, as is also metal brick and stone face siding. The catalog also illustrates and describes slate surface shingles, tarred felt, rosinized sheathing for use between walls and general sheathing purposes, deadening felt, certain-teed wallboard, galvanized ridging, continuous ornamental ridging, galvanized cresting blocks, roll valleys, metal building corners and metal corner beads, expanded metal lath, etc. Of interest in connection with the designing of commercial buildings are the galvanized cornices, lintel and belt moldings, steel ceiling, etc., which are illustrated and described.

Keeping Records of Motor Truck Work

A recent issue of *Traffic News* contains an unusual amount of interesting material relative to the operation of motor trucks made by the Federal Motor Truck Company, Detroit, Mich., and the experiences of a number of owners are given together with picture showing the trucks in service. Of interest to the man who is concerned with getting dependable records as to the operation of his trucks, is an article describing a recording instrument which gives a day's record of the speed made during any part of the day, the length of time in minutes in actual operation, the length of time in minutes of working and loading, the number of trips and stops made, the number of miles traveled per day, the hour the trucks began and finished work, etc. A record such as this will readily enable the truck owner to increase the efficiency of his service, for it shows where any delays may occur.

Wall Board for Government Buildings

One of the effects of the immense amount of building construction which has been and is being done by the Government in connection with its war preparations has been a greatly increased demand for wall board. A striking example of this increased use is found in connection with the Council of National Defense Building and Hoover Food Administration Building for which George A. Fuller Company of New York City are the contractors. These buildings are each two stories in height and 380 ft. in length, and call for the use of 625,000 sq. ft. of Plastergon wall board which was used for the walls and ceilings. The picture Fig. 2 affords the reader an idea of the appearance of one of the completed structures.



Fig. 2—View of Government Building in Which Wall Board Was Extensively Used

Huther Bros. Improved Saw Guard

A new safety appliance for woodworking machines consisting of a table attached saw guard, equipped with electric light, so placed that there is no shadow cast upon that part of the saw that enters the board, has just been placed upon the market by Huther Bros.

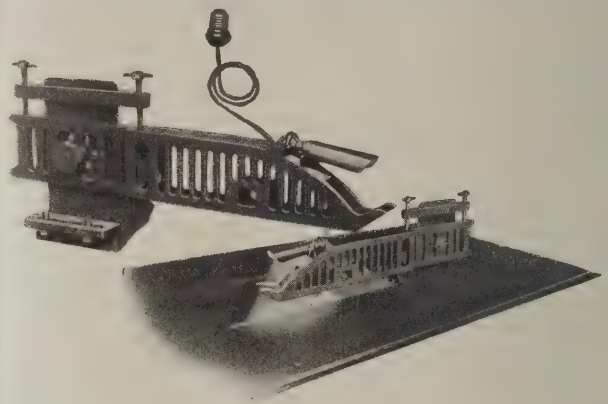


Fig. 3—The Huther Bros. Improved Saw Guard

Saw Mfg. Co., 2500 University Avenue, Rochester, N. Y., an illustration of which appears in Fig. 3. In the upper part of the picture is a view of the guard as it appears detached from the machine and showing more clearly its details. The feature referred to renders the new guard a desirable apliance owing to the fact that mechanics who have objected to the use of a saw guard in the past, are now requesting that their machines be equipped with this device. The saw guard is fitted with a 2 candle power, 120 volt lamp and reflector, thus giving an abundance of light directly where it is needed instead of having it 3 or 4 ft. above the guard and casting a shadow on the work—in many cases causing accidents. The guard is easily attached to any table and can be adjusted to any desired thickness of stock, while at the same time it can be moved backward or forward to fit saws of various sizes. The spreader is so designed that it comes close to the saw to prevent pieces from being caught between the saw and the spreader. The guard has two screws for adjusting—one to prevent the guard from riding on the stock while the operator is working, thereby eliminating all friction, and the other screw is set about ¼ in. from the top of the guard allowing a slight up-and-down movement in case the stock is warped or crooked but not enough so that the operator is in danger. Huther Bros. have issued a new catalogue known as No. 28 in which this guard and other woodworking specialties are fully illustrated and described and a copy of it will be sent to any reader who may be sufficiently interested to make application for it.

Morgan Cold Weather Protection

Among the interesting literature being sent out by the Morgan Sash & Door Company, Chicago, Ill., are several pamphlets illustrative and descriptive of what is designated as Morgan Cold Weather Protection. This.

(*Continued on page 22 of the Advertising Section*)

Do you build stucco garages?

There's good business in building garages.

The auto owner who hasn't a garage wants one and the man who has a garage often wants a bigger and better one. Plenty of demand and you can satisfy it with well-built garages.

Stucco makes the most satisfactory garages, because it is fire-resistant and can be made almost absolutely fire-proof. Its first cost is low—less than brick or stone, nearly as little as wood. The maintenance is almost nothing, for a stucco garage requires little repairs and no painting.

Besides, stucco lends itself easily to almost any design or finish and can be made very attractive—gray, using Atlas Portland Cement; pure white, using Atlas White Non-Staining Portland Cement; or any of a wide range of warm mellow harmonious colors, using Atlas White and exposed colored aggregates—marble and granite screenings, for instance, or colored sand, or gravel.

Ask us about it

We will be glad to send you absolutely free our books on color stucco and stucco garages. Check, sign and mail the coupon below.

The Atlas Portland Cement Company

Member of the Portland Cement Association

New York, Chicago, Phila., Boston, St. Louis, Minneapolis, Des Moines, Dayton, Savannah



ATLAS WHITE

The Atlas Portland Cement Company,
30 Broad Street, New York, or Corn Exchange Bank Building, Chicago
Send me information and specifications on the new color stucco—also the "Contractor's Atlas" and special information on the subjects checked:

☐ New Stucco Homes ☐ Remodeling in Stucco ☐ Stucco Garages ☐ Stucco Bungalows

NAME..... .....ADDRESS.....



First Impressions

Your prospective customers are apt to inspect work that you have done, before employing you.

They lack sufficient technical knowledge to appreciate the deep-seated merits of your work.

They judge your jobs by looks. That's why you should be careful that the first impressions made by your work are favorable.

Murphy Varnish

"the varnish that lasts longest"

will give an especially beautiful long-lasting finish. Everyone who sees it will realize that you have finished your work well. It's human nature to accept good-looking work. You know, and everyone knows, that a good finish usually indicates good work throughout.

Murphy Varnish costs no more in the can but a good deal less on the job. It works easier, goes farther and saves labor and money.

Our principal house-finishing products are:

Murphy Transparent Interior
Murphy Transparent Floor
Murphy Transparent Spar
Murphy Nogloss Interior
Murphy Semi-Gloss Interior
Murphy Univernish
Murphy White Enamel
Murphy Enamel Undercoating

Write for full information.

Murphy Varnish Company

Franklin Murphy, jr., President

Newark Chicago

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

A N A

(*Continued from page 736 of the Editorial Section*)

it is pointed out, is just exactly what the name implies. It is protection for the home interior against icy winds and zero weather. Morgan cold weather protection units differ very little from ordinary windows and doors. They are built in many sizes and can be easily fitted to any home in such a way that they will harmonize with the doors and windows now in use. Morgan cold weather protection front door units are original and artistic in design and contribute greatly to the appearance of any house. One peculiarly pleasing feature of these front door units lies in the fact that it is not necessary to take them down when spring comes. By simply turning a few catches, taking out the glass panel and inserting the screen panel which comes with the outfit, the storm door becomes a screen door, thus doing active service the whole year round. The window units, once they have been hung, can be taken down and put up in a few minutes without the use of tools. These door and window units are constructed of scientifically kiln dried white pine, which, it is claimed, accounts for their stability and the fact that they do not warp, bind, twist and crack as ordinary storm windows or storm doors might do. A complete Morgan cold weather protection is composed of the necessary front and side door units, together with the rear door unit. There are many designs of front door units from which to choose so that every taste can be satisfied. The necessary window units are also furnished in several designs so a choice is given here. Hangers, latches, fasteners, etc., are easily obtained from the hardware dealer. If preferred, however, they will be delivered with the doors and windows. The pamphlets are attractively illustrated and copies may be secured by any interested reader of the BUILDING AGE on application to the company.

Advantages of the Motor Truck to the Builder

A striking instance of the advantages of using a motor truck and trailers by the contracting builder is illustrated in the accompanying picture which represents a 5-ton truck hauling a load of structural ironwork with two Rogers 5-ton reversible short-turn gear trailers. This load was hauled to and from the factory to



Fig. 4—A 5-Ton Motor Truck with Two Rogers Trailers Hauling a Load of Structural Steel

the Pennsylvania Railroad Station, a distance of two miles, to demonstrate what a truck can do with trailers. It was pulled up a 17 per cent grade and then the last trailer with the bottom girder weighing 3½ tons was hauled by a regular Ford runabout just to demonstrate how little traction was required by a car to move the trailer. Next the two trailers, one loaded on top of the other, were hauled by a Ford runabout from Albion, Pa., to Elyria, Ohio, a distance of over 100 miles. In this connection it is interesting to note that Rogers Bros. Company, Albion, Pa., build these trailers ranging in capacity from ½-ton up to 10 tons and adapted for all purposes. The picture shown in Fig. 4 represents a total load of about 16 tons, the second trailer carrying two girders and one column of a total weight of 15,302 lb.

(*Continued on page 24*)



Most of You Mechanics Use

DISSTON
SAWS AND TOOLS

Do You?

Ask any hardware dealer what saw the mechanic prefers and the chances are he'll tell you the **Disston.** Most mechanics **do** use the Disston—a recent investigation again proved that fact.

The endorsement of the majority of skilled artisans, men whose livelihood depends on tools, ought to be a pretty safe guide.

The chances are more than even that you use the Disston now; but if you don't, try them next time.

HENRY DISSTON & SONS, Inc.
PHILADELPHIA, U. S. A.

Branches:

Chicago Boston San Francisco Cincinnati New Orleans Memphis
Portland, Ore. Seattle Bangor Vancouver, B. C. Sydney, Australia
Canadian Works: Toronto, Canada

TRADE MARK REG. U.S. PAT. OFF.



Try This Aloe Level 10 DAYS—FREE

Easy Monthly Payments If You Buy

Prove the superior quality of the Aloe Convertible Level by testing it out for 10 days. Use it on your every day work laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning, shafting walls, piers, etc., for getting angles, or levels anywhere and the hundred and one other things for which you would use a level or transit. Then, if you decide to keep it, you may pay for it in easy monthly payments so small that you will scarcely feel them.

Aloe Convertible Level

is more than a mere level. It is a modified transit permitting double the range of work possible with an ordinary architect's level. Its construction is such that sights above or below the horizontal can be taken, making it the finest instrument ever offered at anywhere near the price. For taking vertical sights the instrument is provided with a special convertible bracket rigidly and permanently attached to the cross-bar thus eliminating the extra time that other instruments require for changing the telescope in position to take vertical readings. The telescope which is fitted with a permanent axis, rests in the bracket bearings and owing to our special constructed clips the instrument can be used for leveling while in this position if desired, although the bracket clips are easily and quickly released from the telescope axis when levels only are to be taken. The telescope is then set in its normal position in the wyes and you have overcome the old method of attaching and detaching the convertible bracket.

Your Own Time To Pay—No Interest

Remember, you are under no obligation whatever to keep the Aloe Convertible Level. We do not even ask you to promise to buy. But you owe it to yourself to see and try it. If it isn't all you expect you may return it at our expense. If you do keep it, you will find the small monthly payments easier than paying rent for an instrument—and at the end of a few months you will own it—absolutely. There's no red tape about this offer—we ask no embarrassing questions—everything is confidential—we charge no interest. You have practically your own time to pay.

Mail Coupon for Descriptive Circular

It explains the Aloe Convertible Level in detail and shows how easily the man without the training of the engineer or surveyor may secure the same accurate results as the expert. Send your name on coupon or postal for free copy and full particulars of our original, unique and popular selling plan.

A. S. ALOE CO., 625 Olive St., St. Louis, Mo.

Mail Coupon NOW

A. S. ALOE COMPANY,
625 Olive St., St. Louis, Mo.

Please send free descriptive circular about the Aloe Convertible Level and complete details of your easy payment plan. This request in no way obligates me.

Name.....

Occupation.....

City..... State.....

KOHLER WARE

always of one quality —the highest

means a pleasing bathroom

A bathroom containing the original, *one-piece* built-in bath, the "Viceroy" produced by KOHLER OF KOHLER, is sure to be a permanent source of delight to your patrons.

This bath, illustrated below, with its *one-piece* construction, graceful lines and KOHLER pure white enamel, has become America's foremost built-in bath. It is installed in buildings of all classes that require the best in plumbing ware.

The KOHLER line includes lavatories and sinks of the same distinctiveness.

The name KOHLER, in faint blue in the enamel, is our pledge that each piece of KOHLER WARE is of first quality. Write for our new book, "KOHLER OF KOHLER."

KOHLER CO.

Founded 1873

Kohler, Wis.

Boston New York Philadelphia
Pittsburgh Detroit Indianapolis
Chicago St. Paul St. Louis
Houston San Francisco
Los Angeles Seattle
London



Cavicchi Floor Surfacing Machine

A floor surfacing machine embodying features which cannot fail to prove of interest to every building contractor who has to meet the problem of surfacing or rubbing marble, tile, mosaic, terrazo, granolithic or composition floors is illustrated in Fig. 5 of the engravings. In construction it is compact and in principle it is said to be radically different from other floor surfacing machines. It is equipped with a 2-hp. electric motor adapted for direct or alternating current as may be most convenient. The width over all is 16 in. and the machine is of such a nature that one man can easily operate it. One of the features is the flexible or compensating wheel which enables it to reach the low and high spots of a floor, whereas a solid wheel practically makes a bridge and necessitates rubbing the low spots by hand. The Cavicchi patent wheel is composed of three individual members or castings which carry the



Fig. 5—General View of the Cavicchi Floor Surfacing Machine

abrasive. These are so arranged that they are free to move independently of one another, thus following the lay of the floor in producing a uniform surface. This wheel is placed directly under the motor and carries nearly all the weight of the machine. It is a self-feeder, runs smoothly and is said to splash but very little. The abrasive blocks are 2⅛ in. high and will wear down to ⅜ in. The claim is made that one man operating this machine can do the work of ten men rubbing by hand, as with the machine a man can cover from 500 to 900 square feet of ordinary terrazo in a day. On granolithic floors, which is regarded as the severest test to which a machine can be put, it has performed an average daily service of about 200 sq. ft. It can finish flush to the wall with the wheel guard removed and 1 in. from the wall with it on. The makers of the machine, the Cavicchi Polishing Machinery Company, 125 Water Street, Quincy, Mass., point out that the compactness of it will permit its operation in small rooms, such, for example, as in a lavatory around the bowl, where the use of a larger machine would be impossible.

In order to meet the demand for a smaller machine of the same design for the use of contractors doing smaller jobs and repairing, the company has brought out a ¾-hp. electric motor machine known as the No. 10 Cavicchi Junior Floor Surfacer. This machine is made from the same high-grade materials as used in the larger machine and will do the same class of work, but not, of course, in the same length of time. By using a ¾-hp. motor the electric currents can be had from any ordinary electric light socket. The company is meeting with a very gratifying demand for these machines, the inquiries coming from all sections of the country from Maine to California, not to mention several foreign countries. One of the most recent sales was to the Westinghouse Church Kerr & Company for shipment to

(*Continued on page* 26)

We are not Playing Checkers

Every man-jack of us at the Carborundum plant is working like the proverbial beaver, for never before has there been such a demand for Carborundum and Aloxite Products.
We are doing our level best to meet this big demand—enlarging our plants, increasing our forces, speeding up production—we are even building a big 20,000 horse power furnace plant in Canada in our efforts to keep up with things. We have a definite service to perform for we are helping to produce the necessities of war.

Carborundum and Aloxite Products are Doing Their Bit

They are grinding shrapnel shells, high-explosive shells, rifle barrels and parts—grinding bayonets and sabers. They are grinding a hundred and one different parts of the aeroplane and the auto truck, the machine gun and the field gun. They are shaping armor plate and grinding car wheels; grinding plowshares, and the tools of the metal-working trades of the world. They are grinding torpedo tubes and torpedoes, grinding submarine engine bases; beveling the lenses of periscopes and buffing the soles of the army shoes and grinding the shears for the pocket kits of the "Sammies." They are doing a thousand and one war tasks quicker and better than they have ever been done before.

Carborundum and Aloxite products are surely doing their bit, but with it all we haven't neglected for one instant our regular patrons—we are doing all in our power to keep up with the pace; to keep up to the standards of Carborundum service.

THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.

NEW YORK CHICAGO BOSTON PHILADELPHIA CLEVELAND CINCINNATI
MILWAUKEE PITTSBURGH GRAND RAPIDS

Fiberlic

Wall Board

The *material* from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic from *strong, permanent, economical* and *sanitary construction.*

MacAndrews & Forbes Company
200 Fifth Avenue, New York City
Factory: Camden, N. J.

Black Diamond File Works

ESTABLISHED 1863 INCORPORATED 1895



TWELVE MEDALS
of award at International Expositions

SPECIAL PRIZE
GOLD MEDAL
AT ATLANTA, 1895

Copy of Catalogue will be sent free to any interested file user upon application.

G. & H. Barnett Company
Philadelphia, Pa.

Owned and Operated by Nicholson File Company

the Rock Island Arsenal, where the company has 260,000 sq. ft. of granolithic floor space to finish.

The Vlchek Mortar Joint Raker

A tool possessing features likely to prove of interest to masons and bricklayers generally, is the Vlchek mortar joint raker illustrated in Fig. 6 of the engravings. This is said to be the first adjustable joint raker with four different widths of blade that has been offered the trade. It will be seen from an inspection of the picture



Fig. 6—The Vlchek Mortar Joint Raker

that the handle is of wood and the plate and other parts are of metal. The point is made that the construction is such that the screw, shown in the engraving, can easily be turned with the heel of the trowel and that one turn does the job. The plate may be adjusted to the width of blade required, after which the screw is tightened and the tool is ready for use. The device is made by the Vlchek Tool Company, 10709 Quincy Avenue, Cleveland, Ohio, which will be glad to send an illustrated leaflet to any reader who may be interested in the tool in question.

The New "Victor" Metal Shingle

The building trade will be interested in one of the latest additions to its line of metal shingles made by the Montross Metal Roofing Company, 113 Erie Street, Camden, N. J., and illustrated in Fig. 7. The new shingle is known as the "Victor" and is so made that when laid on a roof the strongest wind cannot blow water up under the joint that runs horizontally. The

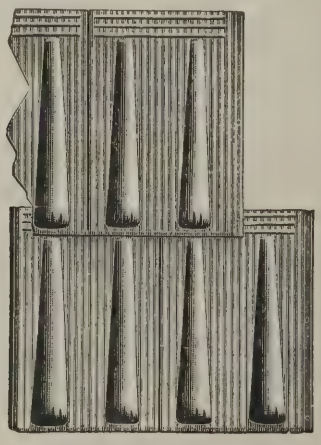


Fig. 7—The "Victor" Shingle

overlapping on a series of corrugations is the secret of the water-tight joint, as shown in the picture. The shingle has a side lock which is equally waterproof vertically, and the ornamental flute not only gives strength to the shingle but gives a finish to a building which is one of its attractions. It is arranged to be used with the Montross specal valley or eaves course, which enables the mechanic to quickly and easily cover a roof of many gables or angles and yet be absolutely sure of making it water-tight. The company makes its shingles

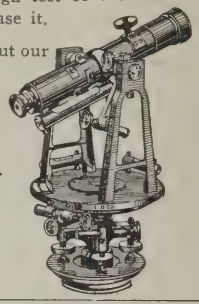
(*Continued on page* 28)


KELLASTONE
IMPERISHABLE STUCCO
SUPREMELY IS SUPERIOR
KELLASTONE
IMPERISHABLE STUCCO
FOR EVERY STUCCOING PURPOSE
ALMOST MIRACULOUS
are the results of covering or overcoating old frame or brick houses with Kellastone Stucco. This work may be done in winter or summer, without disturbing the occupants of the property and at a surprisingly reasonable outlay.
KELLASTONE STUCCO contains no Portland cement, lime or gypsum, is not mixed with water, WILL NOT FREEZE in zero weather, is waterproof and never looks unsightly in wet weather; is flexible and may be bent without injury and is practically immune to expansion and contraction and therefore crack-free.
If you are interested in learning about the strongest, most beautiful and most durable stucco on earth, write for our booklet.
National Kellastone Co.
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CHICAGO
CRAFTON STUDIOS

Let Us Send It On Approval

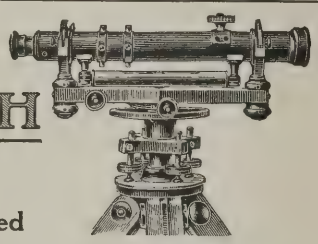
In these times of high prices think of securing an accurate, reliable Builder's Transit for $85.00! And then think of our being willing to have you make a thorough test of the instrument before you decide whether to purchase it.

Ask us to give you further information about our free trial offer. Also ask for our brand new catalog No. 6. It's the finest instrument catalog ever printed. Write us now.



THE L. BECKMANN CO.
300 Jackson Street
TOLEDO, OHIO

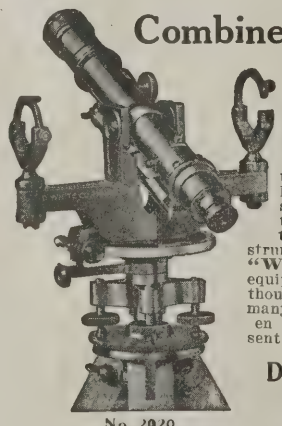
Buy a KOLESCH Level



and you'll be satisfied

Here is a Level that has been designed and built especially for the requirements of Architects, Builders, and Contractors. It will surely pay you to have one, and avoid mistakes which might otherwise prove costly. Light in weight—thoroughly up-to-date in its construction—*sold at a reasonable price.*

KOLESCH & COMPANY, 138 Fulton St., New York



No. 2020

Combined Level and Transit—Try It for 10 Days Free

Either a **level** or a **modified transit** with which to run straight lines, plumb girders, walls, etc. **Instantly convertible** from level to transit. An **accurate, up-to-date, moderate priced** instrument for use on construction work. **"White"** levels have been standard equipment for many years. There are thousands of them in daily use on as many jobs. Try one on your work for ten days free—no obligation. Circular sent on request.

DAVID WHITE CO., (Inc.)
421 East Water Street
MILWAUKEE, WISCONSIN



Something For You

in our Pamphlet 29; viz.:

Valuable Tables for finding size of joist, safe load of joist, actual load on hanger, etc., etc.

Some of these Tables are not in print elsewhere.

The Pamphlet and the Mounted Model Hanger will be mailed on request.

SOMETHING FOR US. We ask your special attention to items 5, 6, 7 on page 5 of the Pamphlet and to the matter on pages 23 and 24 relating thereto.

The W. J. Clark Co.
Salem, Ohio, U. S. A.

of selected material that is first coated with tin and afterwards galvanized and where required can be finished painted in different colors. This is only one of a variety of styles of shingles which the company has been making and the service of which has been thoroughly tested by metal roofers and their customers. The company invites correspondence from those who have never made a specialty of metal shingle roofing, as it can furnish detailed instruction which will enable the novice to make a success with his first job. In addition to metal shingles, the house carries eaves trough, conductor pipe, ornamental finials, formed gutters, ridging and similar indispensable appurtenances of the roofer's trade.

Practical Side of Metal Lath Construction

In the last issue of *Expanded Metal Construction*, published in the interests of better building by the North Western Expanded Metal Company, 904 Old Colony Building, Chicago, Ill., a new feature has been introduced in the shape of the first of a series of articles on the practical side of metal lath construction. These articles, it is stated, will be written by a practical lather and will show the method that he is using in his own work. On another page of the issue is a description of the special features of an unusual structure in Los Angeles, Cal. All suspended ceilings and ornamental plaster cornices throughout the building were plastered over "Kno-Burn" expanded metal lath. Another interesting feature is a double page of illustrations consisting of a group of typical stucco homes in Los Angeles and Pasadena, Cal. There is also an article descriptive of a California bungalow court designed and built by J. M. Close of Los Angeles and in connection with which "Kno-Burn" metal lath was used for the stucco.

Concreting in Cold Weather

The point is well taken that cold weather need not stop concreting. Inexpensive protection and artificial heat are sufficient to keep almost any job going. The advantages are:

1. Equipment busy 12 months—lower overhead.
2. Experienced gangs kept intact—greater efficiency.
3. Labor supply greater—possibly lower costs.
4. Materials more easily obtained—no delay.
5. Earlier use of structure—quicker return on investment.

The methods are very simple and are set forth in a free booklet entitled "Concreting in Cold Weather," being sent out by the Universal Portland Co. of Chicago, Ill. We understand that the company will send copies to contractors for all their superintendents and foremen if they will make their wants known.

The Evolution of Cooking and Heating

"The Evolution of Cooking and Heating" is the title of a unique booklet which has been compiled by H. H. Manchester, A. B., for the Fuller & Warren Company, Troy, N. Y. It is undoubtedly true that the everyday things of life often have the oldest and most interesting histories because of their universal application. Ranked by its length of ancestry, the kitchen would be far more aristocratic than the parlor, and few things have had a more striking evolution. The booklet under review tells of the gradual evolution of cooking from the first exact evidence in Egypt about 6000 years ago. Cooking among the Hebrews, Assyrians, Babylonians, Grecians, Greeks, Romans, Indians, etc., are all described. Reproductions of old tomb pictures, statue prints and other sources, lend added interest to the booklet. The latter part of the work is devoted to the gradual evolution of the modern cook stove.

The Creosoted Lath



Built with Bishopric Stucco Board

Jno. C. Cameron Contractor and Builder Arlington, Mass.

The wood lath in Bishopric Stucco or Plaster Board are thoroughly creosoted. Why?

Because creosoting preserves them, prevents swelling, shrinking, warping, and they withstand exposure to all kinds of weather.

The Union Pacific, the Northwestern, and other railways creosote their ties and telegraph poles for the same reason.

The creosoting of wood is nothing new. It has been done for *many* years—more than long enough to *prove* that it does what it's intended to do. And so it is with every other part of this product—the dovetailed lath, the Asphalt Mastic lining, the fibre board backing—all *ages-old* in principle and acknowledged to be *unsurpassed* for the various purposes intended.

It's the *combination* of these principles and materials into the Bishopric Stucco Board that accounts for the *dependability, efficiency* and *uniform satisfaction* under all conditions, of that product.

THE DOVETAILED KEY "LOCKS THE PLASTER" BISHOPRIC STUCCO OR PLASTER BOARD TRADE-MARK REGISTERED

"Built on the Wisdom of Ages"

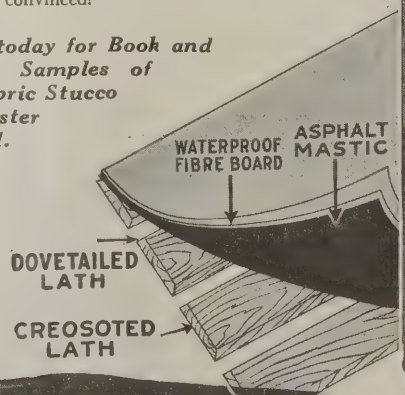
The dovetailed lath hold the stucco so it can't let loose—the Asphalt Mastic is moisture proof and fire resisting, *dampness can't penetrate it*—the sized fibre board protects against heat and cold and is an effective sound-deadener. And all these in combination meet the *most exacting* requirements of a *successful* background for stucco, cement or plasters.

Bishopric Stucco or plaster Board *costs less* than other backgrounds and saves in both material and labor. From *any* and *every* viewpoint it's an *economical* proposition.

Our *free book* illustrates homes, apartments, factory and public buildings on which Bishopric Board has been used. It contains letters from builders, architects and users, and furnishes facts and figures to prove the stability of Bishopric Board.

Don't take our word for this—investigate for yourself—be convinced!

Send today for Book and Free Samples of Bishopric Stucco or Plaster Board.



The Bishopric Manufacturing Co.

913 Este Ave., Cincinnati, Ohio

CUTS THE COST 1/4

Make Your CONTRACTS More PROFITABLE

Save that lost time and labor—do away with the waste of odds and ends.

With an Eveready Saw Rig you can make your door and window frames right on the job, make them when needed—no more waiting for the other fellow, and then besides you make the extra profit.

No matter what kind of work you want done it will do it, and do it right—eleven different operations—the most practical saw rig ever built.

CHIEF TRADE MARK OSHKOSH

EVEREADY SAW RIG

is light and portable—can be moved anywhere—yet is strong and sturdy and capable of standing the heavy strains of contracting work.

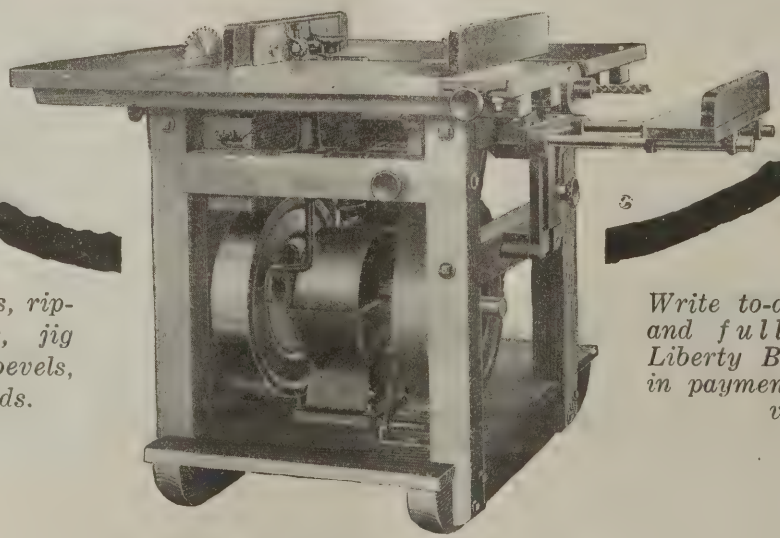
You can set it up in your barn or shop in the winter—it never need be idle.

Moderately priced—a quality product in every respect—a machine the contractor cannot afford to be without.

OSHKOSH MFG. COMPANY

122 Buck St. **Oshkosh, Wis.**

Also Manufacturers of Oshkosh Mixers and Back Fillers



Joists, bores, sands, rip-saws, cross cuts, jig saws, rabbets, bevels, tenons and grinds.

Write to-day for prices and full information. Liberty Bonds accepted in payment at full face value.



STANLEY GARAGE HARDWARE

S.W. S.W.

IN snowy zero weather garage doors that are swung on STANLEY Garage Hinges close snugly and weather-tight like the front door of your home. They help to keep the garage warm. The door doesn't bind and stick, but swings as easily as the day it was hung.

A sudden blast of the north wind can't send the door smashing against the car leaving the garage—not when the doors are held open by STANLEY Garage Door Holders No. 1774.

During the dark nights prowlers will find the doors locked firmly and securely when STANLEY Bolts are used.

The STANLEY Door Pull is adaptable to winter weather because it is roomy, convenient, easy to grip, even when you are wearing a heavy pair of driving gloves.

When you need Garage Bolts, Butts, Hinges, Latches, Pulls or Door Holders use STANLEY and you'll get better results than if you spent time hunting up "special" material.

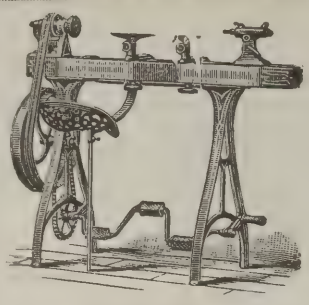
Catalog and complete information on request.

THE STANLEY WORKS

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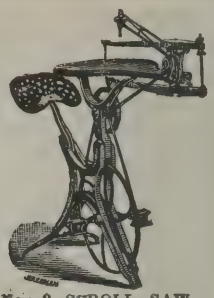
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No. 3 LATHE

Hand-Power-Foot Wood-Working Machinery



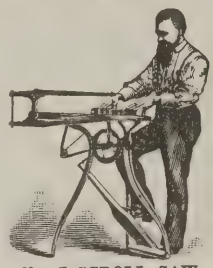
No. 2 SCROLL SAW

A Complete Line for a Carpenter and Builder



TENONER

Our Machines are so constructed that you can take them to the house you are building. Saves Time.



No. 7 SCROLL SAW

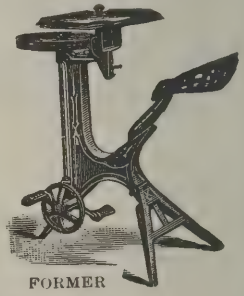
Why buy these Machines? BECAUSE

You can save a millman's profit.
You can make more money with less capital invested.
You can manufacture in as good style and finish, and at lower cost, than the mill.
You can work up stuff ahead in winter for the spring rush in building.
10,000 builders are using from one to eight of our different machines.
Any of our machines will pay for themselves in a year and often in a single job.
Our machines are not complicated, but simple, strong, practical and built for good hard work.

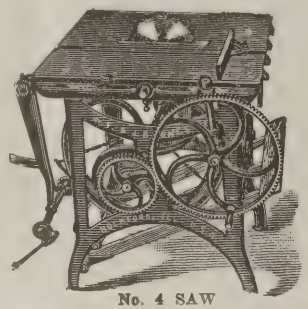
Send for Catalogue and Prices.



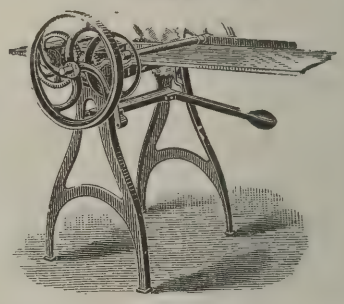
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HAND RIP SAW

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For the outer covering of a building, no other wood gives such long and satisfactory service as

WHITE PINE

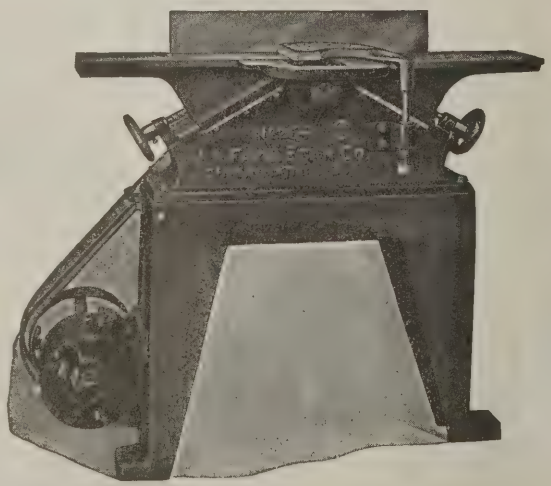
Cut the COST of Your FLOOR SURFACING

The "American Universal" Floor Sander

Saves the wages of five men on your pay roll. Let us tell you about it.



American Floor Surf. Machine Co. 521 S. St. Clair St. Toledo, O.



—a really practical Carpenter's Hand Planer

bench or pedestal—with or without motor

Don't buy a toy—get a real machine—6½" Safety head—thin air-hardened steel knives adjustable bevel fence—removable steel lips—rabbetting arm—pedestal that gives your feet clearance—easy to keep clean under the machine—a practical time saver and money maker.

Write for Bulletin H-7

J. A. FAY & EGAN CO.
221-241 W. Front St., Cincinnati, Ohio

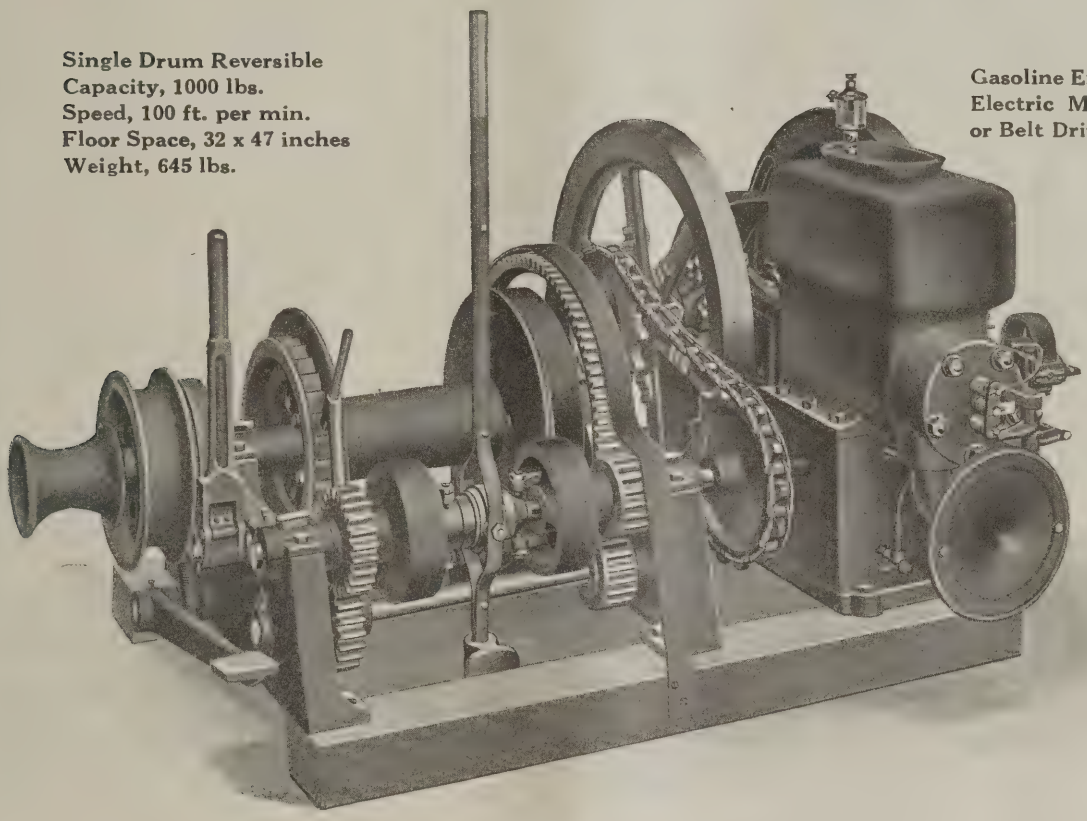
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The "American" No. 4

CONTRACTORS' HOIST

Single Drum Reversible
Capacity, 1000 lbs.
Speed, 100 ft. per min.
Floor Space, 32 x 47 inches
Weight, 645 lbs.

Gasoline Engine,
Electric Motor,
or Belt Drive



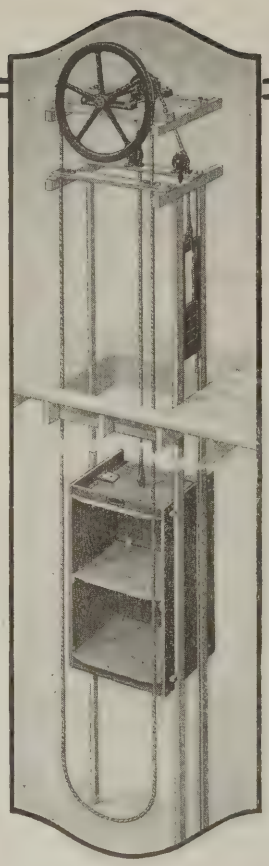
Labor shortage makes machine help more essential than ever before. Up-to-the-minute refinements in this new "American" Hoist help solve the labor problem, speed up your work, cut your costs. It's made for service, speed and safety—it will be a permanently profitable investment—a year-after-year worker that you can depend upon. Look at the picture—sturdiness, compactness, simplicity show in every detail. All controls are conveniently placed. Drum, sheave and winch head are reversible and independent of one another. Gears are well guarded. Powerful brakes keep everything safe. Safety ratchets hold the load at any desired point.

Write for the "American No. 4" Bulletin—get the whole story. Ask also for Bulletin 67 on the "American" Contractors' Woodworker.

American Saw Mill Machinery Company

1362 Hudson Terminal **New York City**

SEDGWICK



IS YOUR PROFIT SECURE?

When you install a cheap dumb waiter, you may *figure* a profit. But are you likely to *secure* it?

Makeshift dumb waiters cause endless trouble. Complaints come fast in cheap outfits—and either you are asked to make good on repairs, or your client loses his confidence in you.

Face the facts. A Sedgwick dumb waiter costs more to install. But the profit it yields is fully protected for you by Sedgwick quality, Sedgwick policy and the Sedgwick guarantee.

Get our catalogue and service sheet. They give all the information you need to specify Sedgwick dumb waiters.

Sedgwick Machine Works

123 Liberty Street **New York City**

Hand Power Elevators and Dumbwaiters, Exclusively

Do Your Millwork on the CRESCENT UNIVERSAL WOOD WORKER

The single feature of being able to have four men work on this machine, each at a different kind of work, at the same time, places it in a class by itself. Each man can control his own work, start and stop his own machine, without interfering with any of the others.

The "Crescent" combines a shaper, band saw, jointer, saw table and boring machine all on one base. By adding attachments, panel raising, tenoing, mortising, tool or knife grinding, sanding, dadoing, resawing, moulding making and pole rounding may be done with dispatch and accuracy.

All told, fifteen different kinds of work can be performed on this machine. Suit it to the work.

Write for catalog of band saws, jointers, saw tables, planers, planers and matchers, disk grinder, borers, shapers, swing cut off saws, hollow chisel mortiser, variety wood workers. Universal wood workers.



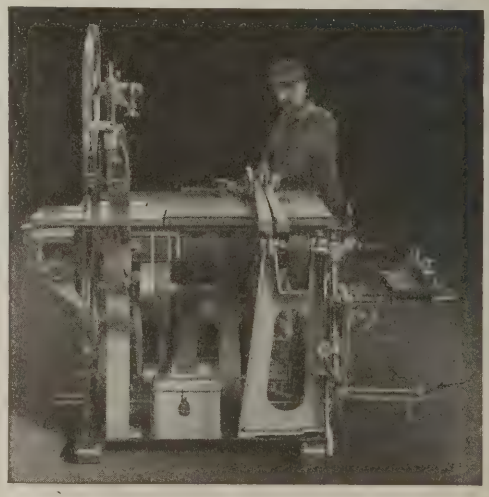
THE CRESCENT MACHINE CO.

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C. H. & E. Portable Saw Rigs

Six Complete Sizes—
3 to 6 H. P. Engine or Motor



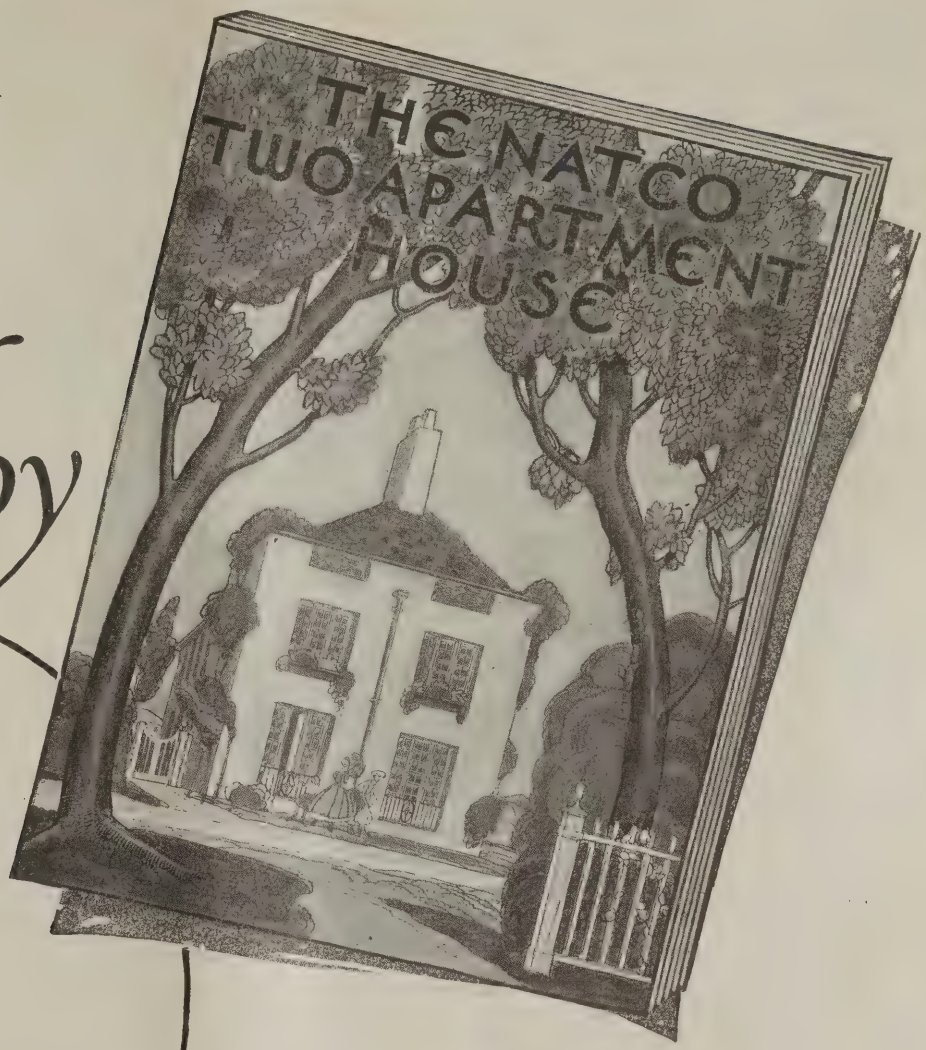
The C. H. & E. No. 6 Portable Saw Rig

Combination or Just Rip and Cross Cut Saw Rigs. Write for Catalog.

C. H. & E. Manufacturing Co., Inc.

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THE popular two apartment house is authoritatively treated in this 72-page book of designs entitled "THE NATCO TWO APARTMENT HOUSE."

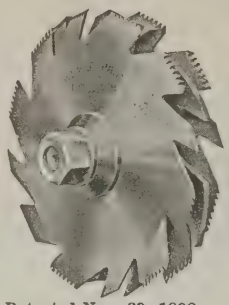
The 40 designs shown are the very latest ideas in exterior designs and interior arrangements.

All those interested in modern methods of fireproof residence construction are entitled to a copy, mailed with our compliments.

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Feb. 19, 1910

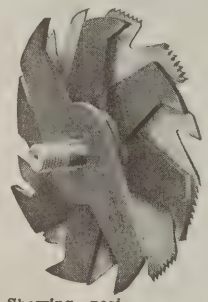
For Your Saw Rig

Huther Bros. Dado Head

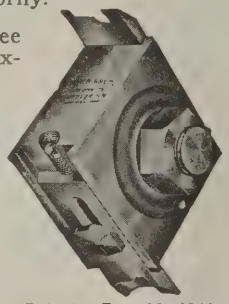
will cut perfect grooves, any width, with or across grain. It consists of two outside cutters and enough inside cutters to make the desired cut.

The Head comes to you ready to use and **guaranteed** to do your work satisfactorily.

Ten days' free trial at our expense.



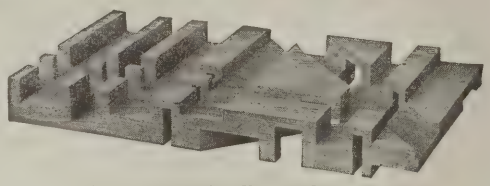
Showing position of cutters on mandril.



This cutter head can be used on the saw table. Knives are adjusted by headless set screws and are held by dovetailed slides and bolts. Runs like a solid cutter. Any shape knives made to order.

Patented Dec. 30, 1913

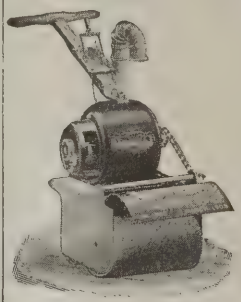
Our No. 34 Catalog sent on request, describes full line of tools for saw rig.



Grooves cut with Huther Dado Head

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THE IMPROVED
RAPID FLOOR SURFACER



will surface right up to the wall or baseboard without the use of Edge Roller. Just the machine you would want for surfacing all kinds of wood floors, whether old or new. Will smooth down rapidly and easily all joints or warped edges. Perfect results guaranteed. More than 20,000 of our machines now in use. Guaranteed against defect in material and workmanship for five years.

Send for our Free Trial Offer. It will interest you.

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Made in several sizes 225-27 W. Illinois St. Chicago, Ill.

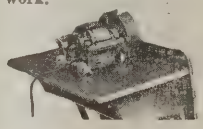
Stop Making "Borderwork"

around your baseboards—which results when you use a narrow edge roll attachment, as its work is uneven and looks different from the rest of the room when finished. Get the same uniform work right up to baseboards that you do throughout the room by using

The Improved Type Automatic Ball-Bearing Electric
Floor-Surfacing Machine



The sanding roller is mounted so one end extends just beyond the side of the machine—easily adjustable to either side so that the wall all around the room can be reached and the **Little Automatic Electric Surfacing Machine** (shown below) is a wonder for removing old varnish from desk tops, tables, counters, etc., as well as for dressing up new work.



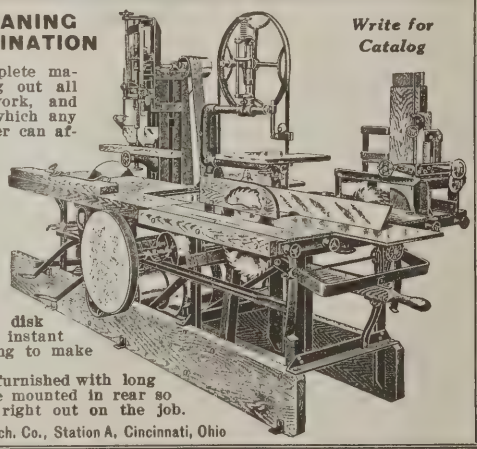
Free Trial Offer

on either of these machines. Write to-day for full information.

WAYVELL CHAPPELL & COMPANY
358 West Madison St., Dept. E, Chicago, Illinois
Phone Franklin 4160

PARKS PLANING MILL COMBINATION

Write for Catalog



The most complete machine for getting out all kinds of mill work, and sold at a price which any progressive builder can afford to pay.

During the screen season, this machine will pay for itself in a couple weeks.

Rip saw
12" Jointer
22" Band saw
Swing cut-off saw
Shaper
Upright mortiser
Tenoner Sand disk

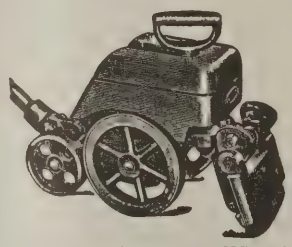
All ready for instant use without having to make any changes.

Machine can be furnished with long bases with engine mounted in rear so it can be taken right out on the job.

Parks Ball Bearing Mach. Co., Station A, Cincinnati, Ohio

FREE to YOU FOR 10 DAYS

THE TRIPLE "A"
SPRING DRIVEN
FLOORSMOOTHER



To enable you to try our machine out, and learn for yourself its many superior qualities, we will send you one of our BRAND NEW Triple "A" SPRING DRIVEN Floorsmoothers for 10 days' FREE TRIAL, freight prepaid.

The Triple "A" is the only floor scraper on the market equipped with a SPRING MOTOR DRIVE—the only convenient motive power. Requires neither fuel nor current—always on tap when wanted. It lessens the work fully two thirds. Only one motion required—the push forward. This winds the SPRING MOTOR which automatically stops the machine and sends it back on the cutting stroke. Will save its cost on one job.

Write today for full particulars regarding our special trial offer.

TRIPLE "A" MACHINE COMPANY
Room 101, 4127 Ravenswood Ave. Chicago, Ill.

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no matter what the size of the house and you'll always have satisfied customers.

MORGAN SASH & DOOR COMPANY, Dept. A-21, Chicago

Factory: Morgan Co., Oshkosh, Wis.; Eastern Warehouse & Display, Morgan Millwork Co., Baltimore. Displays: 6 East 39th St., New York; 309 Palmer Bldg., Detroit; Building Exhibit, Ins. Exch., Chicago.

IMPROVED CIRCULAR SAWING MACHINE

With solid frame and tipping table

APPLICATION ALMOST UNLIMITED

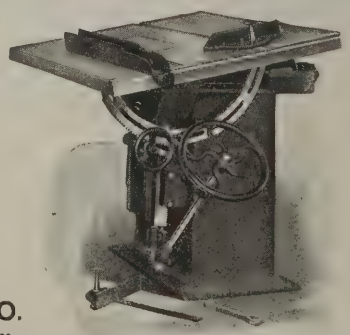


Table can be adjusted to an angle up to 45 degrees.

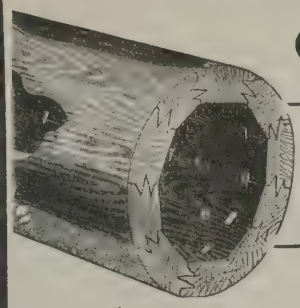
Send for circular giving full information.

We also make wood boring machines in two sizes.

Daniels Planers In Any Length and Width.

R. E. KIDDER CO.
22 Hermon Street, Worcester, Mass.

COLUMNS THAT WILL NOT OPEN



Double V Joint, Moisture Proof.

Staples Straddle the Joints every few inches.

STEEL SEWED STAY-LOCKED COLUMNS depend upon the sturdy little staples, shown in the illustration, capable of resisting enormous tension, hold the joints secure and tight. Put them where you will, in the hottest room, the driest or dampest climate, they positively will not open.

This staple locked construction together with good, honest material, and the general make-up of these columns place them far in advance of all others. We make any size or design.

We guarantee them. Write for illustrated catalogue showing many styles and sizes.



AMERICAN COLUMN CO., Battle Creek, Mich.

Beautiful Oak Floors



Are always the source of unlimited satisfaction and pride.

Of all the hardwood flooring in use today OAK FLOORING stands pre-eminent for color, texture and durability.

From an appearance standpoint nothing is prettier or more artistic than FLOORS OF OAK and a few choice rugs.

OAK FLOORING is a PERMANENT NECESSITY and is found in 95% of all modern houses and apartments.

OAK FLOORING is made in 13/16" thickness and ⅜" thickness.

⅜" OAK FLOORING offers a very BEAUTIFUL and DURABLE FLOOR at a very LOW COST. It makes the ideal floor for laying over old pine floors in old buildings, as well as in new buildings over cheap subfloors. When laid it has all the appearance of 13/16" stock.

CARPENTERS and CONTRACTORS find it very profitable as a side-line in dull periods to lay ⅜" OAK FLOORING in old houses.

All reputable lumber dealers sell Oak Flooring.

Write for Folders.

OAK FLOORING SERVICE BUREAU

1603 Union Trust Building, Cincinnati, O.

If one's *foresight* was as good as their *hindsight*.... they'd buy Sidney FAMOUS machines sooner

It's easy enough to look back on your losses and see how you might have done better. If only it was as easy to **look ahead!**

If your foresight was as good as your hindsight—say!—wouldn't you be a lot better off than you are now? For **one** thing—you would **now** own FAMOUS woodworking equipment and would have in the bank extra profits because of it. Isn't this a good time to write for Catalog 10?

THE SIDNEY TOOL CO.

SIDNEY, OHIO

Learn More About Coulson Store Fronts



Coulson Ventilating and Drainage Sill

Send us drawings of both plans and elevation of the front, or a pencil sketch will do, also correct measurements and we will send you some information on **Coulson Store Front Construction** that may surprise you. We furnish everything complete ready to install. Many new exclusive features—patented for your protection and ours. Catalog and blue prints sent without obligation. Write today.

J.W. Coulson & Co., 107 W. Spring St., Columbus, O.





The Hardware The Flag Follows

Corbin Hardware has been used for many years upon good buildings in the Hawaiian Islands. We illustrate a few of them, designed by O. G. Traphagen.

Hotels	1, 8 and 11
Hotel Cottages	2, 3, 5 and 9
Residences	7, 14 and 15
Business Buildings	4, 6, 10, 12, 13 and 16

P. & F. CORBIN

Division

The American Hardware Corporation

NEW BRITAIN, CONNECTICUT

P. & F. Corbin of New York — P. & F. Corbin of Chicago — P. & F. Corbin Division, Philadelphia



"Show me where I can profit?"

1866 CURTIS WOODWORK

"The Permanent Furniture for Your Home"

Doors
Windows
Window and Door Frames
Storm Doors and Windows
Screen Doors and Windows
Stairways
Newels
Sideboards
Colonnades
Bookcases
Mantels
Window Seats
Wall Panels
Ceiling Beams
Mouldings
Porch Columns
Porch Rail
Porch Balusters
Everything in Woodwork

Go to a Curtis dealer and put that question to him.

He will tell you that CURTIS represents a definite standard of quality in woodwork to thousands of people. He will tell you how CURTIS Woodwork saves you labor costs and how Curtis "On Time" delivery eliminates the delay bugaboo. In case you cannot locate a Curtis dealer, write us.

THE CURTIS COMPANIES, SERVICE BUREAU
1622-1722 S. Second Street, Clinton, Iowa
Manufacturing and Distributing Plants at
Clinton, Iowa Lincoln, Neb. Minneapolis Wausau, Wis. Chicago
Oklahoma City Sioux City, Iowa Detroit Topeka, Kan. Dayton, Ohio
Eastern Offices at Pittsburgh and Washington
The makers of CURTIS Woodwork guarantee complete satisfaction to its users. "We're not satisfied unless you are."

CURTIS Woodwork
is advertised in these strong National and State Farm Papers:

Country Gentleman
Michigan Farmer
Farmer's Guide
Farmer's Mail & Breeze
Wisconsin Agriculturist
The Farmer
Nebraska Farmer
Dakota Farmer
Oklahoma Farmer & Stockman
Wallace's Farmer
Successful Farming
Prairie Farmer
Ohio Farmer
Hoard's Dairyman
Oklahoma Farmer
Farmer's Review
Iowa Homestead
Wisconsin Farmer
20th Century Farmer



Fire-Proof Doors

Metal and Metal Covered

Standard Sizes in Stock of All Designs

Agents Wanted

Write for Booklets and Price Lists—also our Agent's Proposition.



A. C. Chesley Co.
Incorporated
279 Rider Avenue
New York City, N. Y.

BOGALUSA BOGALUSA

"BOGALUSA" is the name *BY WHICH TO BUY* the BEST LONG-LEAF PINE THAT GROWS. (There's a difference.)

BOGALUSA is the name of the city where the best long-leaf pine that grows is cut into every size from great bridge timbers to little laths.

BOGALUSA, in lumber, is more than a name—it is a symbol of superiority and responsibility.

FOR ALL STRUCTURAL USES SPECIFY "BOGALUSA"—that is your guaranty.

And unless you can identify the lumber delivered as real "BOGALUSA" *you'll refuse it* as "not per order."

WRITE US. (*Cutting 1,000,000 feet a day still leaves us time to take an interest in YOU.*)

There's a *value* for you in the *Bogalusa Book.* (Free.) It's full of valuable pine statistics.

GREAT SOUTHERN LUMBER CO.
1603 Fourth Ave., Bogalusa, La.

SOUTHERN PINE SERVICE ASSOCIATION

BOGALUSA

SOUTHERN PINE SERVICE ASSOCIATION

The Trailer You have been Looking For



THE ROGERS LUMBER TRAILER FILLS A LONG FELT WANT

The Rogers All-Steel Trailer, equipped with extension tongue, will haul lumber and poles up to 30 feet in length.
Capacity, 2000 lbs., and will stand up indefinitely under all strains.
The strongest and most durable trailer ever built.
The leading builders are using them—why not you? *Write for our trial proposition.*

ROGERS BROTHERS COMPANY **Albion, Pa.**



The Saving in Modern Home Building

WHERE it formerly was deemed necessary to employ the rarest and most expensive woods to obtain richness and variety in the interior finish and trim of homes, the same effects may be had today with the use of the most plentiful and moderate priced wood, and with no sacrifice of permanent satisfaction.

Using modern stains, paints and enamels of standard quality, it is now possible to attain any desired effect of color or tone in home interiors, employing no other wood than

Southern Pine

"The Wood of Service"

Southern Pine has a wonderfully varied and beautiful grain and a satiny texture, lending itself perfectly to the use of stains. And it takes readily and holds permanently paints and enamels. Southern Pine is extremely durable, yet very workable; it is as perfectly manufactured as any of the expensive hardwoods, is obtainable anywhere east of the Rocky Mountains, **and it costs less than any other home building material of anything like the same high quality.**

If you have home building or remodeling in prospect, it will be well worth your while to send for the handsome new booklets, "The Interior of Your Home" and "Beauty Plus Service in Floors." Mailed gratis, on request, if you address Department A-53.

SOUTHERN PINE SERVICE ASSOCIATION

Southern Pine Association

NEW ORLEANS, LA.

SOUTHERN PINE SERVICE ASSOCIATION

A Woodwork of Moderate Price

which may be stained or enameled with the definite certainty that the finished surface will retain its luster permanently.

Under enamel the grain will not raise nor will the white or tinted surface become yellow or discolored.

Insist upon Trade Marked

ARKANSAS SOFT PINE

at your local source of supply.

This symbol insures a close-grained, fine textured, non-resinous interior trim which will satisfy the most exacting client.

Authentic Painting and Finishing book, Samples and Architects' Manual on request.

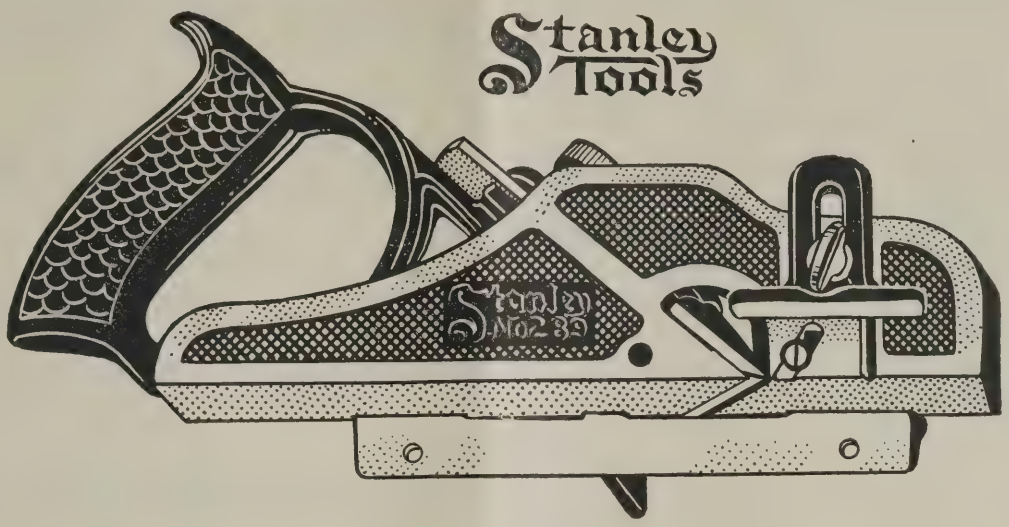
Arkansas Soft Pine Bureau

1045 Bank of Commerce Building

Little Rock, Ark.



Stanley Tools



Stanley Skew Cutter, Filletster and Rabbet Plane

This Plane has a 1¾ in. skew cutter and adjustable spurs. This fence and depth gauge can be attached to either side; the plane is therefore suitable for right or left hand work. The adjustable fence slides under the bottom. Remove arms and fence and a Skew Cutter Rabbet Plane is obtained.

Ask your Dealer to show you this Plane. You will find it to be a very interesting tool.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

ECONOMY
DURABILITY

Pullman Unit Sash Balance

Cost Less Than Cords, Pulleys and Weights



Made entirely of pressed steel, smooth running, unbreakable and practically noiseless.

A carpenter can install twice as many windows with Pullman Unit Sash Balances per day as can be fitted with cords and weights—a saving in labor of 100 per cent. Over six million in use. Recommended by hundreds of Architects. Approved by Fire Underwriters Laboratories.

You can save money by learning more about Pullman Unit Sash Balances. Write today for illustrated Catalog with blue prints.

PULLMAN MFG. COMPANY
8 Industrial St. Rochester, N. Y.

Pullmanize Your Windows

"YANKEE"

Plain Screw Drivers

STANDARD No. 90
CABINET No. 95

They cannot loosen in the handle, in use or abuse.

You have our Guarantee.



They are durable as the high grade steel that composes them, and will render faithful service for generations. The comfortable handle and various lengths of blade make them suitable for all classes of work.

Your Dealer Can Supply

Let us send you a YANKEE Tool Book

NORTH BROS. MFG. CO.
Lehigh Ave., Philadelphia, Pa.



Adze

When you want the best, one that will wear two or three times as long and hold an edge, try a White Adze.

Send for Our Catalogue

Write today before you forget

The L. & I. J. White Co.
100 Perry Street Buffalo, N. Y.

ORIGINATORS OF SASH CHAIN

The Standard for over 35 Years. Capacity of chain plant **35 miles per day. Many imitators, no equal.** Used by the **United States Government** for over **30 Years.**



The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.

The word "WHALEBONE" before Wall Ties means a permanent construction when placed.

Don't order Wall Ties from your dealer. Order Whalebone Wall Ties and get the best.



Standard size for solid or veneer walls 7 x ⅞, weighing 50 pounds to the thousand.

If your dealer can't furnish "Whalebone," wire us at our expense the following:

(Name of dealer) can't furnish Whalebone, (Express, Freight) (number) boxes. (Your name.)

We will ship the same day from our factory or from the nearest dealer handling the Whalebone and guarantee satisfaction in every respect.

Allegheny Steel Band Co., 886-888 Progress St. Pittsburgh, Pa.

Do Business by Mail

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

War Material Mfrs.	Wealthy Men
Cheese Box Mfrs.	Farmers
Tin Can Mfrs.	Axle Grease Mfrs.
Druggists	Railroad Employees
Auto Owners	Contractors, Etc., Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters.

Have us write or revise your Sales Letters

Ross-Gould, 1001 Olive Street St. Louis

Ross-Gould Mailing Lists St. Louis

HYDRATED LIME

THE GREAT SOUND DEADENER

For Scratch and Brown coats. A slow setting plaster. Has great sand carrying capacity and a uniform, smooth and buttery consistency that makes it spread easily. Write for latest booklets containing complete information.

HYDRATED LIME BUREAU OF THE **NATIONAL LIME MFRS. ASS'N**
1511 Arcott Bldg., Pittsburgh, Pa.

Write Today for Free Sample

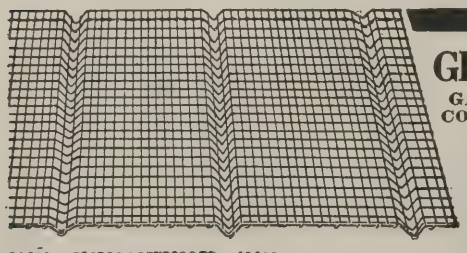
Degrah

TRADE MARK REGISTERED

A New and Wonderful Wood Finish

Quick drying and non-penetrating like Shellac. Glossy, smooth and tough as Lacquer. Less expensive and more durable than Varnish. Takes the place of all three. Dries in three hours. A fresh coat can be applied and sand papered each day. DEGRAH also comes as a white enamel—also as an Enamel Varnish. To the latter you merely add zinc in oil to make your own white enamel. DEGRAH White Enamel saves you big money on contracting work.

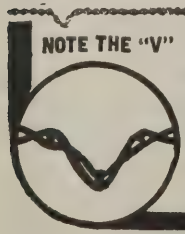
KEYSTONE VARNISH CO., 2013 Keystona Bldg., Brooklyn, N. Y.



GRIMM'S

GALVANIZED CORRUGATED WIRE LATHING

Requires no furring due to the V-SHAPED CORRUGATIONS imbedded at intervals of 7 inches.



It will not rust as it is heavily galvanized with the finest grade of Western Spelter, is much easier to handle and conforms to irregular curves much easier than any other form of metal or wood lath.

Ceilings plastered on this lathing will never crack or drop off. Just the article for stucco work. Write for booklet 61-F.

BUFFALO WIRE WORKS CO., 446 Terrace, Buffalo, N. Y.
(Formerly Scheeler's Sons)
Branch Office and Warehouse: 9-11 S. 7th St., Philadelphia, Pa.



"HOME BUILDER'S GUIDE"
Including Supplement
Complete Blue Prints of this Home. Price One Dollar.
ROBINSON GREENE, Architect
1026 Williamson Building
Cleveland, Ohio

There's beauty and durability and satisfaction for contractor, architect and owner in every brushful of

TRADE MARK **NICE** REG. U.S.A.

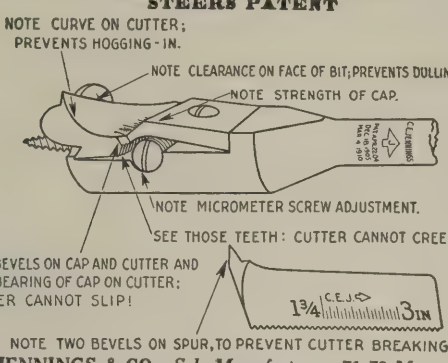
VARNISHES
WOOD FILLERS
PAINTS, STAINS

Prices, Samples, Literature on request.

EUGENE E. NICE, Philadelphia

C. E. Jennings C. E. Jennings ARROW HEAD Trade Mark **Expansive Bit**

STEERS PATENT



C. E. JENNINGS & CO., *Sole Manufacturers*, 71-73 Murray St., N. Y.

Pearson's Automatic Shingle Nailer



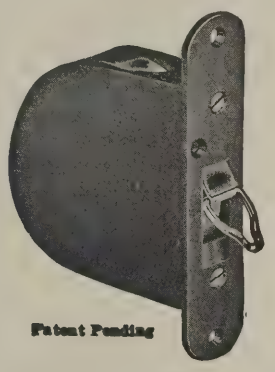
Works well on any pitch roof. Gloves or mittens can be worn and nails driven faster than by the old way. This "Hand Nailer" is the only nailer. Throw nails in by the handful and start nailing, etc. Nails can be driven through tin or quite heavy sheet iron.

PAYS ITS COST ON ONE JOB

Two sizes: BLUE Nailer for 3d common No. 14 gauge wire nails. RED Nailer for 3d galvanized No. 13 gauge 1¼ inch wire nails.
List price $7.00 (*but an order from this ad will bring you either size by prepaid parcel post for only Five Dollars*).

PEARSON MFG. COMPANY
Robbinsdale, Minnesota
Makers of Hand Nailing and Tacking Tools

CALDWELL SASH BALANCES UNIFORM MORTISES



For use in all classes of new work

Box frames unnecessary

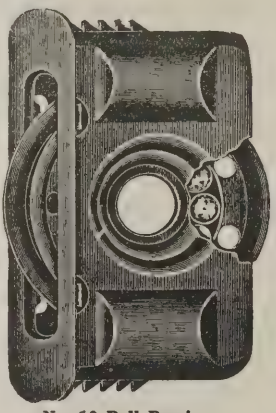
Mortises cut at mill reduce cost of installing. Counterbalance sashes at any given point. They outwear ordinary weights and cords. Unaffected by atmospheric conditions.

Cheapest method for modernizing old windows, as alterations in sashes and frames are not necessary. Sashes should be weighed before ordering.

Write for Circular

Patent Pending

Caldwell Mfg. Company
5 Jones St., Rochester, N. Y.



No. 10 Ball Bearings

"Grand Rapids" All Steel Sash Pulleys

Fasten automatically. No nails. No screws. Just bore 4 holes.

The automatic saw tooth fastening feature and the easily made mortise will save in labor the cost of the pulleys.

Frictionless, Noiseless, Everlasting.

Write for free samples.

Grand Rapids Hardware Co.
160 Eleventh Street, Grand Rapids, Mich.

COPPER CABLE SASH CHAIN



Thomas Morton
245 Centre Street
NEW YORK

COPPER CABLE
STEEL CABLE
CHAMPION METAL
STEEL CHAMPION

SASH CHAINS

CHAINS

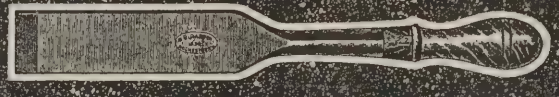
For Suspending Heavy Doors Gates, Etc.

All of SUPERIOR QUALITY



CHAMPION METAL SASH CHAIN

MACK & CO.



YOU will always feel secure when you use Barton Planes and Edge Tools. The making of keen edged tools that hold their sharpness is our hobby. If your dealer won't supply you we will.
There is some mighty interesting and profitable reading in "The Carpenter's Catalog" and "True Stories." Both free, of course.

Brown's Race & Platt St., Rochester N.Y.

GOODELL-PRATT



1500 GOOD TOOLS

Write for Complete Catalog

Goodell-Pratt Company
Greenfield, Mass.

Toolsmiths

Desco METAL STORE FRONTS

Make Dull Months Productive

When building slows up, when new construction is postponed or abandoned, it does not necessarily mean that your business must be curtailed.

Desco Store Front construction, if properly pushed, will fill the gap profitably. For many stores in your city, forced to abandon their building plans, will remodel to increase the attractiveness of their present quarters. Desco construction is simple and easily installed and the price allows you to meet competition profitably.

Write us for details TO-DAY

DETROIT SHOW CASE COMPANY
483 Fort Street, West
DETROIT MICHIGAN

A Good Equipment

Is the Best Aid To Accuracy

Every carpenter and builder who wants to do better and more efficient work should add all of these tools to his kit. No matter how complicated the measurement is, he will find that a good equipment of

TRADE MARK
Starrett Tools
REG. U.S. PAT. OFF.

will enable him to work faster and more accurately and with less effort. The deeply etched graduations stand out clearly and permit very accurate readings. Some Starrett Tools include many tools in one. There are many tools for the carpenter described in our free catalog No. 21P.

Write for a copy today.

For Sale at All Good Hardware Stores

The L. S. Starrett Co.
The World's Greatest Toolmakers
Athol, Mass.

42-656



PRESSED STEEL DOOR STOP

Seamless and Practically Indestructible

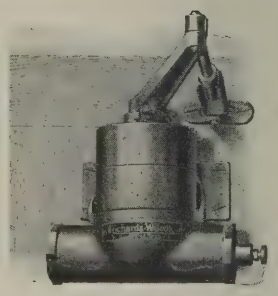
These door Stops are far superior to all others from the fact that they are made of the highest quality cold rolled steel, drawn into shape from one piece of material, making them seamless. They are absolutely the strongest stops ever placed on the market and are guaranteed to be indestructible. Fastened in place with three round-head screws.

Finished in any of the Griffin hardware finishes. Wrapped and packed with screws.

The Griffin Mfg. Company
Erie, Pa.

17 East Lake St. Chicago, Ill. **30 Warren St. New York**

A New Appliance— Old in Experience



To YOU, perhaps, the R-W Door Closer and Check for swing doors needs no introduction. We placed it on the market two years ago, but have never advertised it because we could not fill the orders as fast as they came in. The material we insist on using in the manufacture of this Door Check has been hard to get, and we refuse to fill orders with a substitute.

Lately our efforts to get this material have met with better results; that's why we are presenting the Richards-Wilcox Door Closer and Check publicly now for the first time.

Reasons Why Richards-Wilcox No. 643 Has Met With Particular Favor

Spring cannot be overwound.

Liquid occupies separate chamber from spring mechanism, which prevents leakage of oil.

Adapted to right or left hand swing doors.

Simple and effective spring adjustment.

All parts machined to a perfect fit and are interchangeable.

Made in six sizes for various weights of doors.

Various finishes. Brackets furnished if desired.

Sold by the best Hardware Trade everywhere.

Write for folder giving complete description and prices. Sent without obligation.

Richards-Wilcox Manufacturing Co.

SAN FRANCISCO LOS ANGELES NEW YORK CHICAGO

AURORA, ILLINOIS, U.S.A.

PHILADELPHIA MINNEAPOLIS BOSTON ST. LOUIS

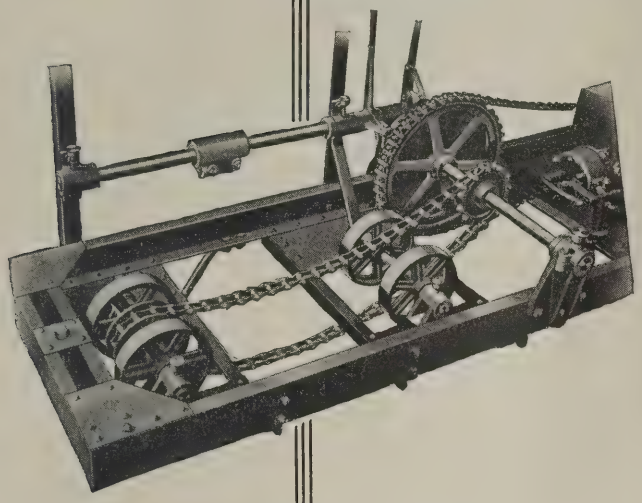
Richards-Wilcox Canadian Co., Ltd., London, Ont.

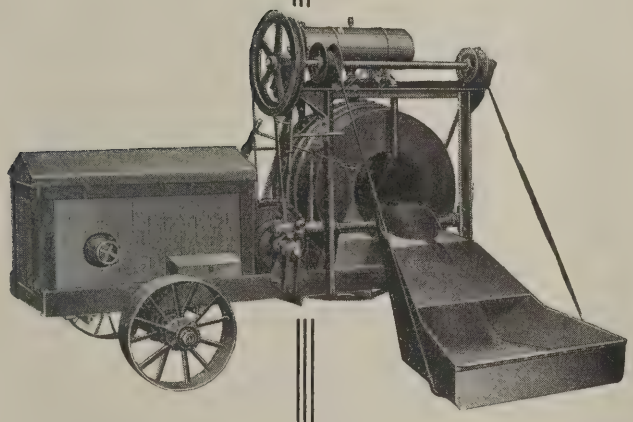
"A hanger for any door that slides"

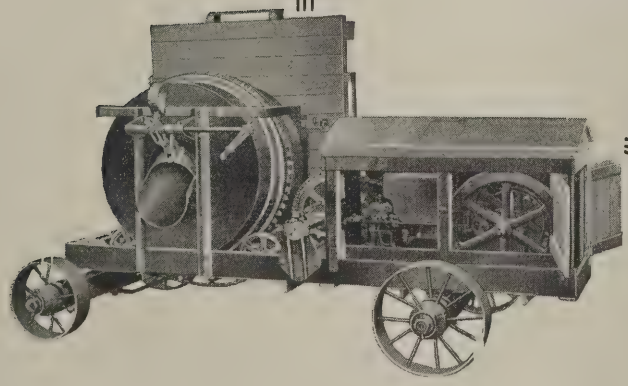
SOMETHING NEW

THE

SMITH UNDER-SLUNG CHAIN DRIVE







Right now, when price "boosting" is an everyday occurrence, it will be refreshing to read about a "LOWER" price.

What is more to the point is this: this "lower" price is for a NEW type of mixer—the 7-S Smith-Chicago Mixer, equipped with the **Smith Under-Slung Chain Drive.**

Do you get the full significance of the **Smith Under-Slung Chain Drive?** Instead of the chain passing around the drum, it goes under it.

The 7-S Smith Chicago Mixer with the **Smith Under-Slung Chain Drive** means Dollars in your pocket on all concrete construction work. MAIL THE COUPON.

THE T. L. SMITH CO.

3120-G Hadley Street, MILWAUKEE, WIS.

MAILING COUPON

Send me, without obligation on my part, copy of your

FOLDER NO. 158-G

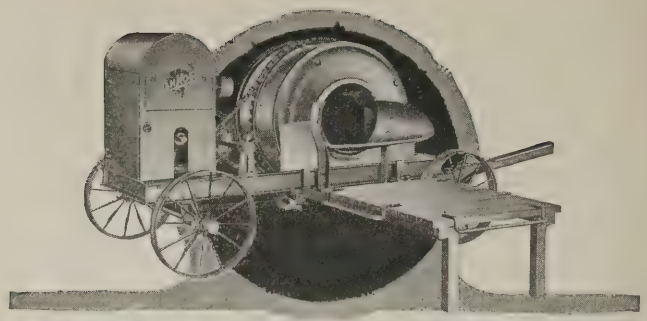
describing your new 7-S Smith-Chicago Mixer with the UNDER-SLUNG CHAIN DRIVE.

Name .....

St. No. .....

City .....

State .....



SERVICE
at the **RIGHT TIME—**
WHEN YOU NEED IT

A few days wasted waiting for repairs may mean a forfeited contract, but you will have a minimum delay if you own an

OSHKOSH Low Loading MIXER

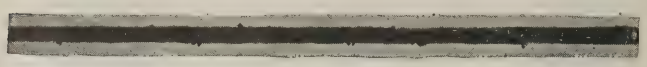
for your dealer is prepared to give you prompt service whenever an accident causes you to need repairs.

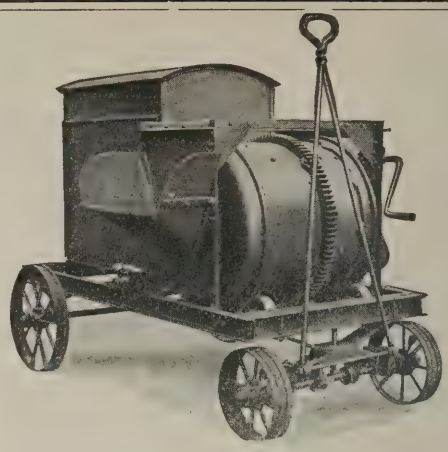
The Oshkosh is economical, simple and durable. A quality machine in every respect.

Write today for catalog and prices.

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The Lansing Small Job Money-Maker

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It sells itself to contractors who investigate and compare.

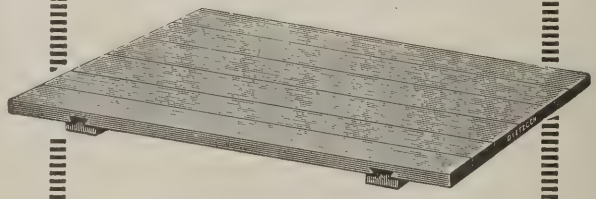
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are accurate, dependable, and perfect in workmanship.

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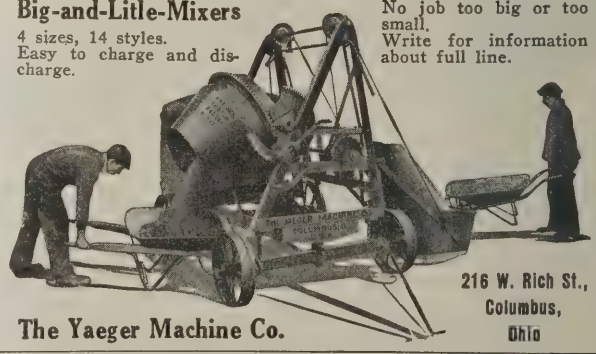
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Big-and-Litle-Mixers

4 sizes, 14 styles.
Easy to charge and discharge.

No job too big or too small.
Write for information about full line.



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HOUSE PUMPS

The next time you have occasion to recommend or install a house or cistern pump remember the Myers Line.

Here are some of the special features which produce splendid pumping service — Cog Gear Head—Operate 33⅓% Easier; Extra Long Stroke and Large Air Chamber insure capacity; Reversible Spout and Handle, easy to place; Brass, Brass Lined or Polished Cylinders give variety of styles.

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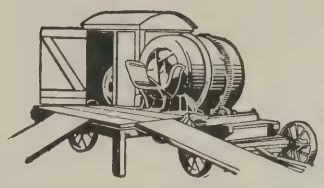
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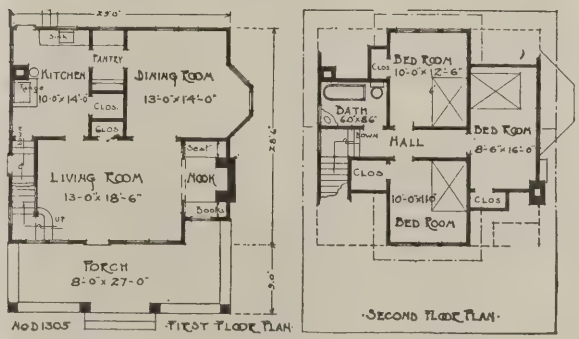
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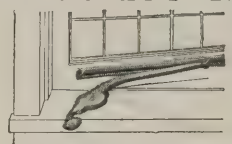


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For both right-hand and left-hand casements. Can be opened as much or as little as desired, so that air can be admitted without also admitting rain or snow. Locks automatically, works easily. Gives a house a very distinctive appearance. Strong, durable, moderate price.

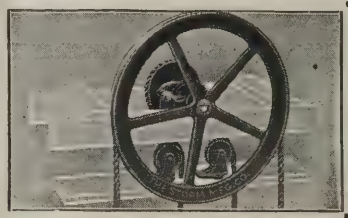
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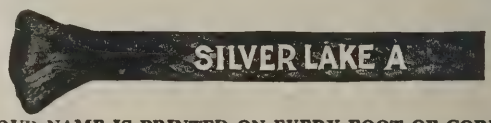
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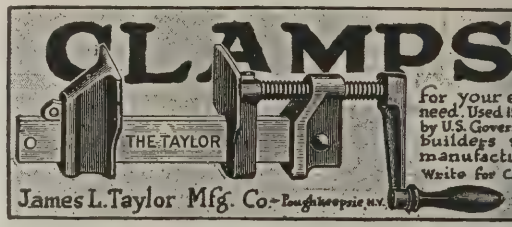
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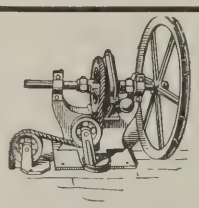
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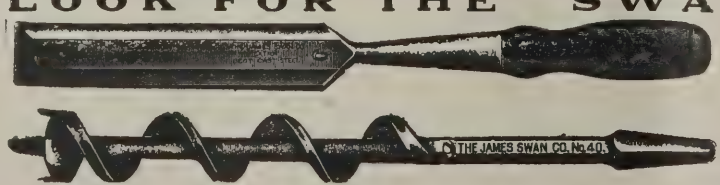


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can be operated by Hand, Belt, or Electric power. Any Capacity.
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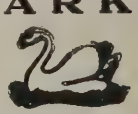
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On Chisels, Bits, Gouges, Augers, Draw Knives, Screw Drivers, etc. High Grade Mechanics' Tools known to all good workmen.



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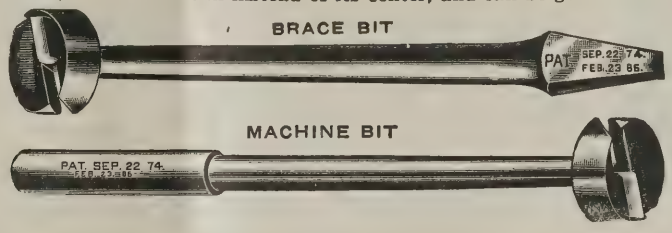
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BORES ANY ARC OF A CIRCLE

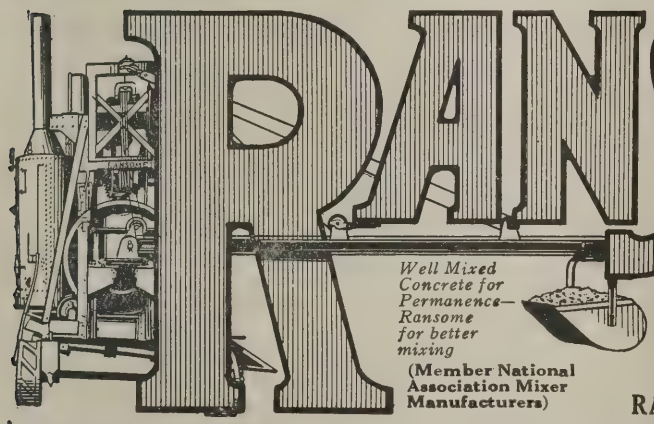
As it is guided by its circular rim instead of its center, and can be guided in any direction

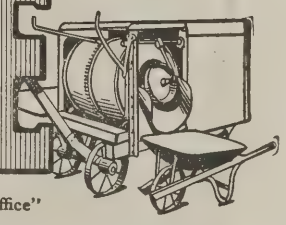


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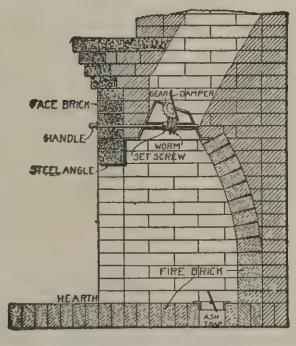
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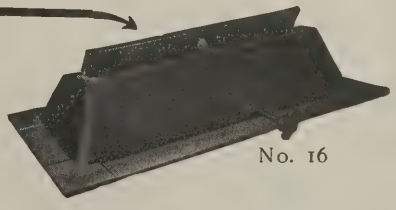
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No. 16

This damper is made in lengths from 30 to 78 in.

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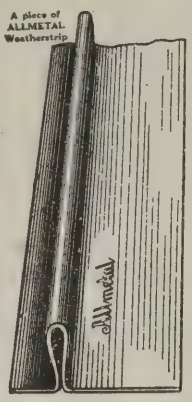
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Old, shrunken, warped and out-of-square openings of every kind made dust and draft-proof.

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This pattern is used more than all others combined.

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This kind made metal weatherstripping a business.

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ARE YOU THE MAN?

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Cortright Metal Shingles are suitable for your regular run of work and can be easily applied with entire satisfaction to your clients. Our illustrated book of roof facts we believe would interest you. May we send it?

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Weatherproof Corners

That's what you get when you finish a house with

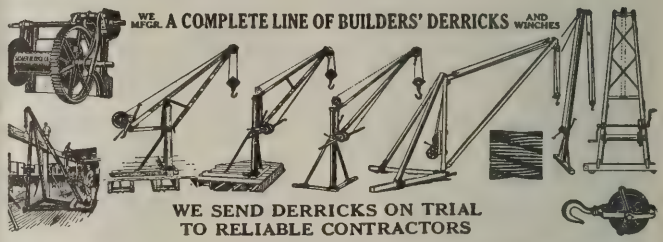
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Building Corners

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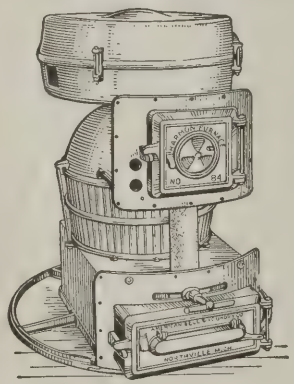
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Winthrop Tapered Asphalt Shingles

The *Only* Kind Tapered Like Wood

R. G. Castleman, 120 West 46th St., Bayonne, N. J., writes: "I am enclosing a small picture of our house, which is claimed to have the finest appearing roof in the vicinity. We used red Winthrop Tapered Shingles on the roof and gray on the sides. The house was built in 1915 and there is not a sign of wear on the roof." Contractor Agents wanted. Write for sample shingle.

THE BECKMAN-DAWSON COMPANY
ASPHALT SHINGLES
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Here's something right in your line—a Chemical Closet that you can sell to a home builder cheaper than a wooden privy and make a bigger profit for yourself. Here's something you can sell at odd times or turn over to your son or your foreman to sell.



RO-SAN Chemical Closet

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AGENTS WANTED

We want one live carpenter contractor in each town to act as our agent. Hundreds of builders are selling these fixtures. Good profits for little work. We help you sell them. Write today for complete details.

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Ask about the Ro-San Washstand. Hot and cold running water without plumbing.



The Recessed Steel Medicine Cabinet

HESS MEDICINE SANITARY CABINET LOCKER

The Only Modern, Sanitary STEEL Medicine Cabinet

or locker, finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimming. Steel or glass shelves.

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Makers of Steel Furnaces. Free Booklet



The Outside Steel Cabinet

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FLEX-A-TILE Slab Shingles
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Samples of the Heppes-Nelson products may be had at any time, together with prices and practical suggestions as to the creating of new roofing business.

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Use roofing material that gives service and satisfaction, that costs less than most others, is easy and inexpensive to lay, and that makes a neat durable surface.

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your estimate will be much lower, your profits bigger if you use

CON-SER-TEX CANVAS ROOFING

It is a canvas roofing chemically treated to protect the fiber from mildew, and the detrimental action of the oil in paint. It's water-proof, weather-proof, wear-proof.

Investigate—samples showing widths, weights, prices and complete details sent upon request.

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Pass on, Mr. Repair Man!



For years and years—

This RU-BER-OID Roof will need no repairs.

For RU-BER-OID is sparkproof, rotproof, rustproof and weatherproof.

It contains nothing that can crack, warp, melt or leak.

Many imitations LOOK like RU-BER-OID. Ask your dealer to show you the *genuine*, with the "Ru-ber-oid Man" on the roll.

Made in Slate Gray, Tile Red and Copper Green.

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Also makers of Ru-ber-oid Shingles and Impervite Waterproofing for Concrete



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RU-BER-OID ROOFING

COSTS MORE - WEARS LONGER

MADE BY THE STANDARD PAINT COMPANY, NEW YORK BOSTON CHICAGO

Look for the "Ru-ber-oid Man" on every roll of genuine Ru-ber-oid



This Test proves that Moisture cannot injure—

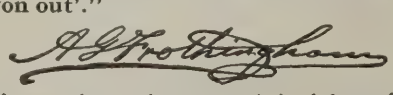
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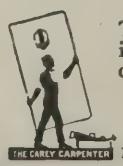
Ceil-Board

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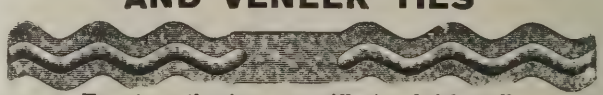
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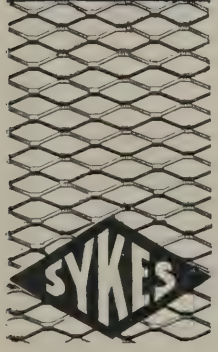
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Of BUILDING AGE, published weekly at New York, N. Y., for October 1, 1917.

State of New York, County of New York, ss.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Fred S. Sly, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the BUILDING AGE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, The Architectural & Building Press, Inc., 243 West 39th St., New York City. Editor, Henry Colwell, 243 West 39th St., New York City. Managing Editor, Willard C. Howe, 243 West 39th St., New York City. Business Manager, Fred S. Sly, 243 West 39th St., New York City.

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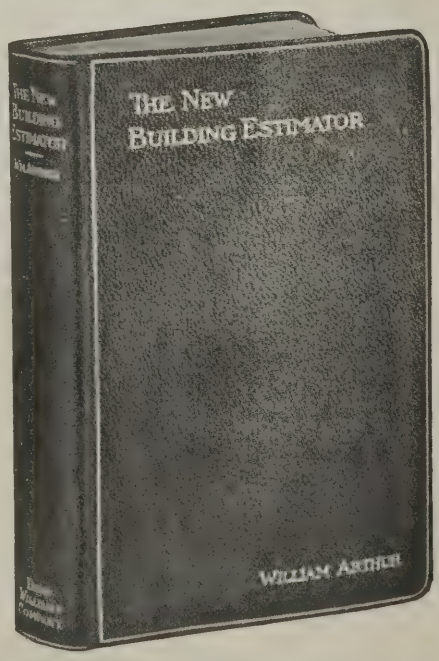
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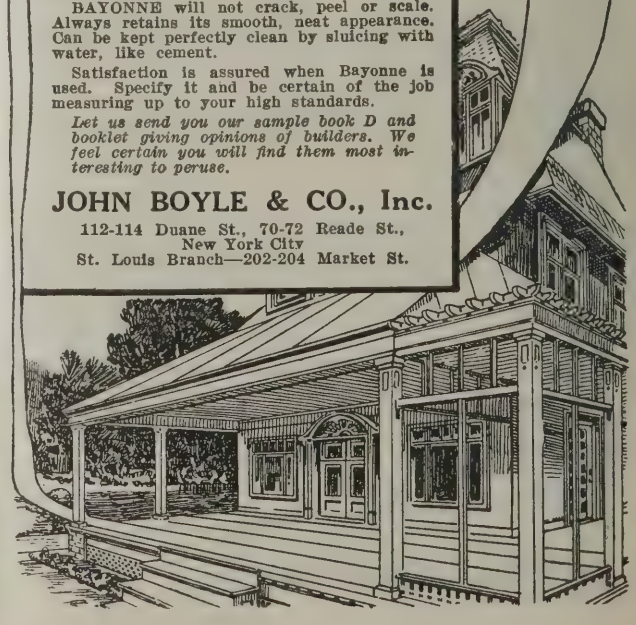
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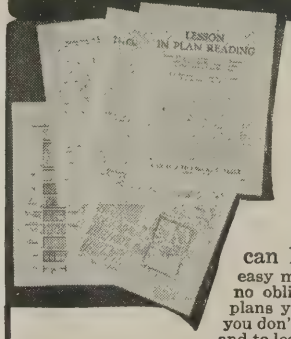
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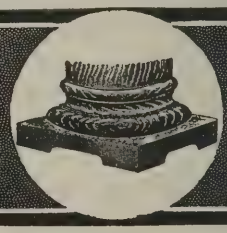


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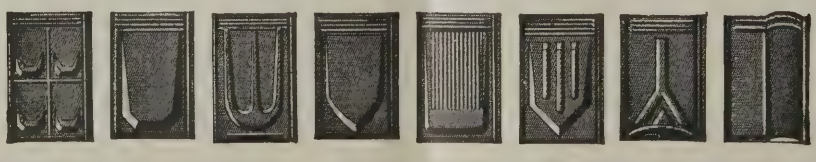
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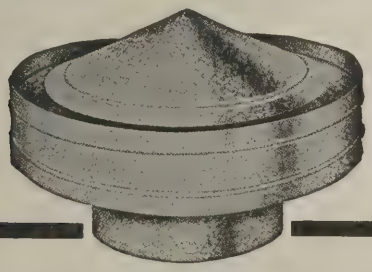
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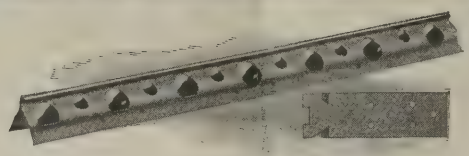
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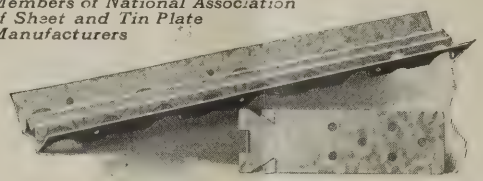
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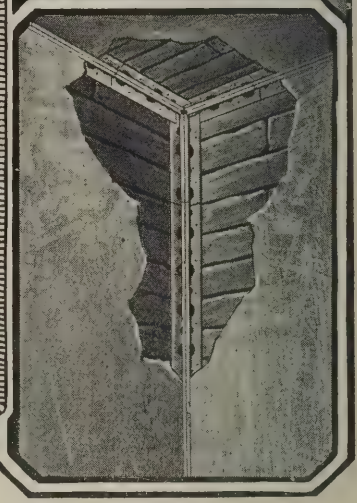
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